STUDY OF RHEUMATOLOGICAL MANIFESTATIONS AMONG PATIENTS WITH DIABETES MELLITUS

A THESIS SUBMITTED TO

BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT (PUNJAB)

IN THE PARTIAL FULFILLMENT

FOR THE AWARD OF DEGREE OF

DOCTOR OF MEDICINE

IN

GENERAL MEDICINE

MAY 2022

Submitted By

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Dedicated

to

my Family

&

Teachers

ACKNOWLEDGEMENT

All praises belongs to almighty the most merciful and the kindest for giving me the opportunity, courage and enough energy to carry out and complete the entire thesis work.

I am grateful and deeply indebted to my guide ***Dr. Narender Pal Jain****, Professor Department of Medicine DMCH, Ludhiana. I have the great privilege and honors to express my whole hearted indebtedness to him for kindly placing at my disposal all the facilities available in the department for his guidance supervision, inspiring encouragement, constructive criticism and help in carrying out the thesis work.*

I owe my gratitude to my co-guide ***Dr. Parminder Singh,*** *HOD Endocrinology, DMCH, Ludhiana and my co-guide* ***Dr. Sandeep Chhabra****, associate professor, Department of medicine DMCH, Ludhiana for their valuable advice and cordial cooperation.*

I owe a deep sense of gratitude to ***Dr. Vikas Gupta,*** *Associate Professor department of rheumatology for his keen interest on me at every stage of my research. His prompt inspirations, timely suggestions with kindness, enthusiasm and dynamism have enabled me to complete my thesis.*

I express my gratitude to the Prof. and Head Department of medicine ***Dr. Dinesh Gupta*** *for his support and guidance. He has been a continuous guiding force throughout the study.*

I must thanks ***Dr. Aarju, Dr. Monika, Dr.Abhishek, Dr. Manuja, Dr. Pawan, Dr. Onkar*** *,* ***Dr Rajnish*** *and* ***Dr. Sushil****, who have guided me through many phases of thesis and helped in keeping me sane during tough times.*

My thanks and appreciations go to my colleagues ***Dr Ujjwal ,Dr Abhinav , Dr Karanjot , Dr Anu , Dr Kanchan and Dr Mehak*** *people who have willingly helped me out with their abilities.*

During the entire study period Nobody has been more important to me in the pursuit of this project than the members of my family. I would like to thank my parents ***Mr Ranjit Singh Maan*** *and* ***Mrs. Bhupinder Pal Kaur*** *whose love and guidance are with me in whatever I pursue. I would like to thank my elder sister_****Loveleen Maan*** *and brother-in-law* ***Baljinder Singh*** *for standing by my side all the times and uplifting me whenever I was in low spirits.*

Lastly I am indebted to all the patients and their guardians involved in this study for their cooperation and patience without this study would not have been possible.

I duly acknowledge the contribution of ***Mr Naveen, Miss Aman*** *and* ***Mrs Namita Bansal*** *for helping me in this uphill task with utmost sincerity and dedication.*

Dr Kushdeep Singh

LIST OF ABBREVIATIONS

ACR / EULAR	American college of rheumatology and the european league against rheumatism
BMI	Body mass index
CAD	Coronary artery disease
CH ARTH	Cheiroarthropathy
CTS	Carpal tunnel syndrome
DISH	Diffuse idiopathic skeletal hyperostosis
FBS	Fasting blood sugar
MODY	Maturity onset diabetes of young
LJM	Limited joint mobility
OA	Osteoarthritis
OHA	Oral hypoglycemic agents
PPBS	Post prandial blood sugar
RA	Rheumatoid factor
W/H RATIO	Waist over hip ratio

ABSTRACT

Objectives*:* Diabetes mellitus is associated with various rheumatological manifestations that are debilitating and affect the quality of life . Above study was conducted To study the clinical profile of Rheumatological manifestations in diabetic patients.

Methods*:* 300 diabetic patients were examined for rheumatological manifestations during the period Jan 2020 to June 2021.Apart from routine investigations fasting and postprandial blood glucose, glycosylated hemoglobin and X –rays of involved joints wherever required were done.

Results*:* Rheumatological manifestations were seen in 50.7% patients with diabetes mellitus compared. Osteoarthritis of knee was seen in 20.3% diabetics It was the most common manifestation among diabetics. Diffuse idiopathic skeletal hyperostosis was observed in 7.3% of diabetics. Adhesive capsulitis was noted in 8.3% of diabetics. Carpal tunnel syndrome was seen in 10.7 % of diabetics. 6% cases was suffering from Diabetic cheiroarthropathy/limited joint mobility, 2.3% cases were suffering from Flexor tenosynovitis/trigger finger. Majority of the study participants (n=164) had diabetes for 5 to 10 years.

Conclusion:. In our study proportionately higher prevalence of rheumatological complications were observed in patients with uncontrolled diabetes mellitus than among with good glycemic control. We recommended thorough evaluation for rheumatological complication along with macro and micro vascular complications as they are often missed and clinically overlooked. This study also highlights importance of various other risk factors for rheumatological manifestations such as obesity (BMI), good glycemic control and treatment may reduce morbidity associated with rheumatological manifestation thereby improving quality of life in patients with diabetes.

Keywords*:* *Diabetes, Rheumatological manifestations, Periarthritis of shoulder, DISH, Osteoarthritis of knee, Carpal tunnel syndrome.*

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INTRODUCTION

Diabetes Mellitus is fast emerging as a global epidemic. It presents with a myriad of acute and chronic complications of which macrovascular and microvascular complications dominate the physician's and patient's attention. The conventional risk factors of urbanization, unhealthy dietary practices as well as physical inactivity, coupled with inherent genetic attributes and differences in body composition are propelling the increase in prevalence of diabetes.[1]

Accordingly, diabetes related complications are also on the rise and contribute significantly to the overall morbidity and mortality. The major complications of diabetes are classified as micro-vascular and macro-vascular. But the long-term and often infrequently addressed complications like those involving the musculo-skeletal system can be more debilitating by causing limitation of movement, thereby creating a vicious cycle of poor glycemic control and reduced quality of life.[2]

Rheumatologic disorders have been described in diabetic patients that can be divided into four categories: disorders representing intrinsic complications of diabetes, disorders that are related to deranged metabolism, disorders sharing similar etiological mechanisms, and certain rheumatological disorders that are common in general population but also observed to have an increased prevalence in the diabetic population.[3]

Degenerative joint disease (Osteoarthritis), that involves the large weight bearing joints, is the commonest rheumatic disease in the general population. Obesity is a big risk factor for both diabetes mellitus as well as osteoarthritis. Several studies have reported an association of early osteoarthritis and DM. Both large and small joint osteoarthritis have been reported to be increased in type 2 diabetes. The incidence is more in type 2 diabetics as compared to type 1 diabetics.[4]

The rheumatological complications are very common but often ignored and highly under-recognized. They can be very incapacitating and contribute to

significant physical disability and impair quality of life. The exact pathophysiology of these rheumatological complications is not known, however, connective tissue disorders, neuropathy or vasculopathy may have a synergistic effect. Changes in the connective tissue of patients with diabetes are probably due to disturbances in the structural macromolecules of the extracellular matrix.[5]It is also postulated that prolonged hyperglycemia results in collagen glycosylation. This glycosylated collagen is less soluble, offers increased resistance to collagenases and accumulates in connective tissue, which not only alters extracellular matrix structure and functions but also impairs cell viability thus resulting in various manifestations.[1]

Although the precise etiology of diabetes associated rheumatological disorders remains elusive, evidence indicate, hyperglycemia may accelerate nonenzymatic glycosylation and abnormal collagen deposition in periarticular connective tissues, which in turn alter the structural matrix and mechanical properties of the musculo-skeletal tissues leading to diffuse arthrofibrosis and stiffness.[6]

Among various conditions that are not so particular as a clinical manifestation of diabetes mellitus, diabetic cheiroarthropathy is the most important disorder related to limited joint mobility. This disorder results in a stiff skin and joint contractures. Adhesive capsulitis of the shoulder, flexor tenosynovitis, and Duputryen's and Peyronie's diseases are also linked to limited joint mobility. Diffuse skeletal hyperostosis, due to calcification at entheses, is frequent and early, particularly in type 2 diabetes.

Neuropathies cause some non articular conditions, mainly neuropathic arthritis, a destructive bone and joint condition more common in type I diabetes. Algodistrophy, shoulder-hand and entrapment syndromes are also frequent. Mononeuropathy causes diabetic amyotrophy, characterized by painless muscle weakness. Among muscle conditions, diabetic muscle infarction is a rare, sometimes severe, condition. Among articular conditions, osteoarthritis is frequent and early in diabetes, in which also chondrocalcinosis and gout occur.

Rheumatoid arthritis (RA)and diabetes I have a common genetic background and the presence of diabetes gives to RA an unfavorable prognosis. Among bone conditions, osteopenia and osteoporosis may occur early in type 1 diabetes. Contrarily, in type 2 diabetes, bone mineral density is similar or, sometimes, higher than in non diabetic subjects, probably due to hyperinsulinemia.[7]

Although researchers have occasionally dealt with the prevalence and types of various rheumatological manifestations, studies exploring the factors associated with the coexistence of rheumatological manifestations and diabetes mellitus are scarce. Studies from India are fewer.

The present study was undertaken to find out the distribution of different rheumatological problems in the Indian diabetic population and the factors associated with this occurrence.

AIMS AND OBJECTIVES

To study the clinical profile of Rheumatological manifestations in diabetic patients.

REVIEW OF LITERATURE

Diabetes mellitus is a multi-system disease characterized by persistent hyperglycemia that has both acute and chronic biochemical and anatomical sequelae.[8] The World Health Organization has projected that the global prevalence of diabetes mellitus accounting for 85-95% of all cases will increase from 125 million in 1995 to 300 million by the year 2025.[9]

The metabolic disturbances of diabetes mellitus cause chronic irreversible damage to vital organs and systems. Though the cardiovascular, renal and ocular complications of diabetes are the most severe, there are various rheumatological manifestations which occur more frequently in patients with diabetes mellitus than in the general population. In contrast to various vascular complications of diabetes mellitus which are life threatening, rheumatological manifestations lead to considerable morbidity.[10]

The rheumatological manifestations associated with diabetes mellitus can be classified under four categories [11]:

Consequence of diabetic complications

- Diabetic muscular infarction
- Neuropathic arthropathy

Consequences of metabolic derangements inherent to diabetes

- Diffuse idiopathic skeletal hyperostosis
- Osteopenia
-

Syndromes that may share etiogenic mechanisms with microvascular disease.

- Adhesive capsulitis of shoulder
- Dupuytren's disease

- Limited joint mobility syndrome (cheiroarthropathy)
- Palmar flexor tenosynovitis

Probable association with diabetes

- Carpal tunnel syndrome
- Gout
- Osteoarthritis

Diabetes mellitus affects connective tissues in many ways and cause different alterations in periarticular and skeletal system.[12]A study done by Cagliero E[13]showed prevalence of rheumatological manifestations was greater in diabetic patients (36%) than in patients in the control group (9%) and more common in patients with type 1 diabetes than in those with type 2 diabetes mellitus.

Most of the musculoskeletal manifestations seem to be associated with the duration of diabetes mellitus and appear in diabetic patients of younger age, than their counter parts in general population.[14]

Adhesive Capsulitis of Shoulder

Typically presents as complete progressive painful limitation on active and passive mobility specially abduction and external rotation. It's prevalence in diabetic varies from 10-29%. Increase prevalence of shoulder calcification has been noticed with long duration of disease and treatment with insulin.[15] Bridgman[16]identified adhesive capsulitis in 11% of 800 diabetic patients as compared with 2.5% in 600 control patients. In 4.5% of the patients with adhesive capsulitis, both shoulders were involved. In the study done by Mavrikakis[17]it was found that 31.8% of diabetics had shoulder calcification compared with 10.3% of the control group. The calcific shoulder periarthritis was located in the right shoulder in 44.7%, in the left shoulder in 26.7 % and bilaterally in 28.6% of the patients with diabetes.

Study done by Pal[18] showed shoulder capsulitis was present in 19% of patients with diabetes mellitus and 5% of normal subjects. Adhesive capsulitis was seen in 20.4% of patients with type I diabetes and in 18.3% of patients with type 2 diabetes. In a study by Mavrikakis[17], of 824 type 2 diabetics & 320 control subjects shoulder capsulitis was observed in 31.8% and 10.3% of subjects respectively. Study done by Sarkar[3] showed that frozen shoulder was present in 17.9% of 860 diabetics and 7% of 800 non diabetics. Study done by Enrico Cagliero[13] showed adhesive capsulitis was present in 12% of the diabetic patients and none of the control patients. Diabetic shoulder capsulitis appears at a younger age, is less painful, respond less well to treatment and usually lasts longer than non-diabetic shoulder capsulitis.[19] High frequency of other hand syndromes such as limited joint mobility or cheiroarthropathy has been found among diabetic patients with shoulder capsulitis.[20] Study done by Balci N[21] showed significant association of shoulder adhesive capsulitis with carpal tunnel syndrome, Dupuytren's disease and limited joint mobility syndrome.

Various studies[12,13] showed that adhesive capsulitis of shoulder was seen in patients with poor glycemic control.

Shoulder hand syndrome

The association of adhesive capsulitis with pain, swelling, dystrophic skin and vasomotor instability of the hand constitutes the "shoulder hand syndrome". It is a rare, but potentially disabling manifestation of diabetes.[22]

Steinbrocker and Argyros described three stages of this syndrome. First stage lasts for 3-6 months and is characterized by pain, tenderness, swelling and vasomotor changes. The second stage lasts for 3-6 months and is characterized by trophic skin changes and in the final stage there is atrophy of skin and subcutaneous tissue, tendon contractures and progressive osteopenia. Motor abnormalities such as tremors, involuntary movements and muscle spasms have been reported.[23]

Diabetic cheiroarthropathy

Diabetic cheiroarthropathy is also known as diabetic stiff hand syndrome, diabetic hand syndrome and syndrome of limited joint mobility. It is characterized by thick, tight, waxy skin with limited joint range of motion and sclerosis of tendon sheaths.[24] The possible sites in the tissues leading to impaired mobility include alterations of the structures in the hand such as intrinsic muscle, joint capsule, subcutaneous tissues and alterations of structures extensive to the hand such as long flexor muscles and flexor tendons of forearm.[25]A study done showed that limited joint mobility was significantly more frequent in the diabetic patients 36 out of 80, than in the controls 7 out of 47. Out of 36 patients, 9 patients had severe joint limitation, 13 moderate limitation & 14 slight limitation. The 7 control patients with joint limitation had only slight impairment of joint mobility. A history of additional rheumatic complaints was seen in 21 diabetic patients. A study done showed limited mobility of small & large joints in 92 of 309 patients with diabetes. Among patients who had diabetes for >4.5years, 82 of 169 had joint limitation and > 50% of these patients had microvascular complications.[26]

In the study by Sarkar[10], limited joint mobility was seen in 113 diabetic patients (13.1%) out of which 92.1% were of type 1. Of the 113 patients 93 had diabetes for more than 5years duration. Limited joint mobility and Dupuytren's disease are commonly found in the same patient. Limited joint mobility is more prevalent in patients with diabetic neuropathy than in those without.[27] Study by Renard E[28] showed prevalence of various soft tissue hand lesions was higher in both type 1 and type 2 diabetics (33.3 and 26.7%) than in their control population (5.0 and 8.3%).

Dupuytren's disease

Thickening, shortening, fibrosis and nodule formation of the palmar fascia is termed Dupuytren's contracture. The pathological changes result in flexion contracture of the fingers. It is the most common rheumatologic manifestation of diabetes seen in the hand[3.] In patients with diabetes, ring and middle finger

are more commonly affected compared to the fifth finger in patients without diabetes.[29]

The pathogenesis of Dupuytren's contracture has been described as the occurrence of modified fibroblasts that resemble smooth muscle cells and are contractile within tendon nodules. Proliferation of these cells with subsequent contraction, might subject neighbouring fascial structures to intermittent tension resulting in hypertrophy.

Dupuytren's contracture occurs in more than 1/3rd of the patients with diabetes especially those with longstanding poorly controlled diabetes.[30]Prevalence of Dupuytren's contracture in diabetic patients ranges from 20-63% compared to 13% in the general population.[31] A study by Holt[32]has shown that 21-63% of patients with diabetes have Dupuytren's contracture in contrast to 5-22% of the normal population.
Noble[30] reported the development of this complication in more than 50% of patients with diabetes and an increase in incidence with duration of diabetes. As high as 16% of adults with diabetes had Dupuytren's contracture at the time of diagnosis of diabetes mellitus.

Ardic F et al conducted a study and reported that the prevalence of Dupuytren's contracture in diabetic patients ranged between 16 and 42 % as compared to 13 % in the general population.[33]The prevalence was found to be higher in patients who were older and with a longer duration of DM. The authors recommended that the patients with Dupuytren's contracture maybe evaluated for DM, as 13–39 % of them were found to have DM.

Carpal tunnel syndrome

Carpal tunnel syndrome is a disorder characterized by paraesthesia over the median nerve cutaneous distribution. It is caused by compression of median nerve within carpal tunnel, diabetic neuropathy or combination of both.[27] It's specific relation to diabetes is thought to be due to median nerve entrapment caused by diabetes induced connective tissue changes. Tinel's sign and

phalen's test assist in the diagnosis of CTS
CTS is more common in women than men. Phalen reported that diabetes was present in 63 of 379 patients with carpal tunnel syndrome. The prevalence of CTS in diabetic patients increases with the duration of diabetes.[20]

Carpal tunnel syndrome is common in patients with diabetes, the prevalence is 11-16%. In the study done by Renard[29] carpal tunnel syndrome was seen in 26.7 and 15% of type 1 and Type 2 diabetics as compared to 3.3 and 5% of the control population.

Perkins et al reported a prevalence of CTS in diabetic patients to be higher and estimated to occur in 14 % in patients without diabetic polyneuropathies and up to 30 % in those with diabetic polyneuropathies.[34]

Neuroarthropathy

Neuroarthropathy is a severe destructive form of degenerative arthritis resulting from loss of sensation in the involved joints. It is also called Charcot's joints or diabetic osteoarthropathy.[20] Diabetes is one of the major causes of Charcot's joints. It is usually seen in long standing diabetes often complicated by hypertension, proteinuria and retinopathy. The foot is most commonly involved followed by ankle and knee. Unilateral painless foot swelling is the most common finding.

It may result from repeated trauma, often minor, in the setting of decreased sensation due to a sensory neuropathy which results in increased damage with microfractures. An alternative possibility is that the neuropathy triggers an increased blood flow or distal hyperemia that results in stimulation of osteoclasts with increased bone resorption, osteoporosis, fractures, and joint damage. Recently, inflammation has been identified as another factor in the development of neuropathic osteoarthropathy. The release of proinflammatory cytokines leads to increased expression of the polypeptide receptor activator of nuclear factor-κB ligand (RANKL).[35]

Radiographically there are destructive changes of the tarsometatarsal and metatarsophalangeal joints, which include circumscribed osteoporosis, subluxation, osteolysis, fractures and periosteal reactions. Radiological features appear usually late in the disease. The incidence is mainly 0.1-0.4% in diabetic patients. The duration of disease in diabetics is approximately around 15 years. Study done by Sarkar[10] showed that the neuroarthropathy of knee and foot was seen in 3.2% of diabetics as compared to 0.6% non diabetics.

Diffuse idiopathic skeletal hyperostosis

Diffuse idiopathic skeletal hyperostosis is also known as ankylosing hyperostosis. It is characterized by flowing calcification of paraspinal ligaments. It commonly affects thoracic spine followed by the lumbar and cervical spine.[3]

A proposed pathogenesis for the occurrence of DISH in patients with diabetes mellitus is the prolonged and high levels of insulin and insulin like growth factors occurring in diabetic patients, which stimulates new bone formation. Marked hyperinsulinemia has been demonstrated in DISH.[28]
In the study by Holt[33], DISH was seen in 25% of patients among 428 diabetics.

Lebiedz-Odrobina D et al reported that the prevalence of DISH in type 2 DM was reported at 13–40 %, while in general population, 2.2–3.5 %.The prevalence of metabolic syndrome was found to be higher among patients with DISH.[36]

Osteoarthritis

Osteoarthritis or degenerative joint disease is the commonest rheumatic disease in the general population. It most commonly involves the large weight bearing joints. The prevalence of osteoarthritis of large and small joints is higher among patients with diabetes.[7]The incidence is more in type 2 diabetics.[20]

CrispondHeathcoate reported that OA is more common in young and middle aged diabetics. The joint damage starts at a much earlier age and is more severe in diabetics than in control population. Study done by Sarkar[6] showed

osteoarthritis and diabetes have a positive correlation. It was observed in 31.1% of diabetic patients. Out of this 31.1%, 85% were type 2 diabetics and the incidence among women (78%) was higher when compared to men (57%). Dahaghin et al described an association between diabetes and hand osteoarthritis that was noted in people aged 55–62 years and was absent in other age groups.[37]

Gout is a heterogenous disorder characterized by hyperuricemia and arthritis. It usually affects lower extremities.[8] It has been demonstrated that the prevalence of the metabolic syndrome among patients with hyperuricemia or gout is higher than the others. Insulin resistance and type 2 DM have also been noted to be associated with gout. It was found that the incidence of insulin resistance in gout patients increased by as much as 35 % over individuals without gout.[38]

In the study conducted by Sarkar, [6] acute gouty arthritis was seen in only 0.8% cases, although symptomatic hyperuricemia was seen in 3% patients with diabetes mellitus. In a study conducted in 6000 patients with diabetes, no case of gouty arthritis was found. Framingham study also showed no association between diabetes mellitus and gouty arthritis.[7]

Flexor tenosynovitis

Flexor tenosynovitis or trigger finger is caused by fibrous tissue proliferation in the tendon sheath leading to limitation of the normal movement of the tendon.[27] The prevalence of flexor tenosynovitis is estimated at 11 % in diabetic patients, compared with less than 1 % in nondiabetics.[39]

In the study by Renard[24], flexor tenosynovitis was seen in 23.3% and 16.7% of type 1 and type 2 diabetics respectively as compared to 0 and 3.3% in the control population.

From various studies we can conclude that adhesive capsulitis, diabetic hand syndrome, Dupuytren's contracture and DISH are more prevalent in diabetics

than non diabetics. Despite the lack of a proven pathophysiological basis, these interrelationships may be clinically relevant. The prevalence of one of these manifestations may provide a clue to underlying glucose intolerance. The diabetics should be monitored regularly, as they are at an increased risk for the development of rheumatological manifestations than the general population.

MATERIALS AND METHODS

Source of Data

300 randomly selected patients with diabetes mellitus who visited Endocrinology and Medicine OPD at Dayanand Medical College and Hospital.

METHOD OF COLLECTION OF DATA

Sample size: 300 patients with diabetes mellitus.

Duration of study –This cross-sectional study was carried out on 300 randomly selected individuals with documented diabetes mellitus(DM) who attended the Medicine and endocrinology OPD of Dayanand Medical College & Hospital, Ludhiana for a period of January 2020 to June 2021.

Inclusion criteria:

Consenting subjects aged 18 years and above with documented type1 or type2 diabetes mellitus whoattended the Medicine and Endocrinology OPD of Dayanand Medical College and Hospital.

The criteria for diagnosis of diabetes mellitus were according to the criteria laid down by the American Diabetes Association, 2007.

- Fasting blood glucose>126mg/dl
- Postprandial blood glucose>200mg/dl
- Symptoms of diabetes plus random blood glucose>200mg/dl

Exclusion Criteria:

- MODY
- Latent onset diabetes
- History of trauma related musculoskeletal morbidities

- Patients with Pre-Existing chronic kidney Disease
- Previous cerebrovascular accident

Standardized definitions used in diagnosis

1.Adhesive capsulitis (frozen shoulder):The diagnosis of Adhesive capsulitis shoulder was made in patients with pain in shoulder for at least 1 month, an inability to lie on the affected shoulder and limitation of active and passive range of movement greater than 25% in both abduction and external rotation compared to the other shoulder.

2. Carpal tunnel syndrome: Diagnosis of Carpal tunnel syndrome was based on Tinel's test and Phalen's test.Tinel test – light percussion over median nerve at flexor retinaculum elicits a tingling sensation in the distribution of the nerve .Phalen test -Maintain flexion of wrist at 90 degree angle for 30 -60 seconds , positive test – tingling and numbness over median nerve distribution .

3. Dupuytren's contracture: Patients having pitting and thickening of the palmar skin with a firm, painless nodule, fixed to the skin and deep fascia with contracture of the ring and little finger.

4. Diabetic cheiroarthropathy (limited joint mobility): was evaluated by the 'Prayer sign' in which the patient was asked to touch the palmar surface of the interphalangeal joints together with the fingers fanned and the wrist maximally extended. if they were unable to do so, test was considered positive.

5. Flexor tenosynovitis: Patients having a palpable nodule, usually in the area overlying the meta-carpophalangeal joint (MCP), and thickening along the affected flexor tendon sheath on the palmar aspect of the finger and hand. The locking phenomenon may be reproduced with either active or passive finger flexion.

6. DISH: Radiographic finding of involvement of at least 4 contiguous vertebra of thoraco – lumbar spine, preservation of the intervertebral disc space, and absence of sacroiliitis.

7. Rheumatoid arthritis:EULAR/ACR classification criteria for RA.

8. Osteoarthritis: Diagnosed using Altman's clinical criteria of radiographic osteophytes along with one of the following criteria.

1. Pain 2. Crepitus 3. morning stiffness < 30 min 4. age > 60 years

Procedure

After obtaining informed written consent, each and every person was subjected to thorough medical history with special emphasis regarding time since diagnosis of Diabetes and presence of complications, if any. A detailed clinical examination was undertaken on each patient with special emphasis on the examination of the musculoskeletal system. Patients with other forms of diabetes (Cushing's), those with non-rheumatological causes having rheumatological manifestations in association with diabetes mellitus (eg, cerebrovascular accident with frozen shoulder, Dupuytren's contracture due to alcoholism) as well as those with end-stage renal disease and history of trauma related musculoskeletal morbidities were excluded. Data collected included age, sex, history regarding duration of diabetes, age of onset , mode of treatment , family history of diabetes and musculoskeletal problems encountered if any(pain , restriction of movement and swelling of the joint with duration of symptoms were documented).The anthropometric measurements, weight in kilograms and height in meters was recorded. The body mass index was calculated using the formula weight in kilogram/height in metre^2 ,Measurement of waist and hip circumference was done. Routine investigations including complete blood count, urine analysis, fasting, and postprandial plasma glucose were done. Long-term glycemic control was assessed by hemoglobinA1c (HbA1c) levels. X-rays of the involved joints were

done. Blood glucose level estimation was done by the Hexokinase method in venous blood. HbA1C estimation was done by High Performance Liquid Chromatography. Musculoskeletal complications the assessment was done by clinical examinations and X-ray. A trained physician proficient in Rheumatology made the clinical diagnosis of musculoskeletal problems.

Statistical Analysis

Data were described in terms of range; mean ±standard deviation (± SD), frequencies (number of cases) and relative frequencies (percentages) as appropriate. For comparing categorical data, Chi square ($\chi 2$) test was performed and exact test

was used when the expected frequency is less than 5. A probability value (*p* value) less than 0.05 was considered statistically significant. All statistical calculations were done using (Statistical Package for the Social Science) SPSS 21version (SPSS Inc., Chicago, IL, USA) statistical program for Microsoft W

OBSERVATION AND RESULTS

There were 300 study participants in our study. The mean age of the study participants was 58.78 (S.D=10.14) years with a range of 32 years to 88 years. The mean duration of diabetes was found to be 8.9 (S.D= 5.78) years. The mean age of onset of diabetes was found to be 50 (S.D= 5.78) years. The mean BMI of the study participants was 24.17 Kg/m^2 ranging from a minimum of 18.9 Kg/m^2 to a maximum of 44.20 Kg/m^2. The mean waist to hip ratio was 0.92 (S.D=0.08). The fasting blood sugar was found to be 137.30 mg/dL, the mean postprandial blood sugar was found to be 198.69 mg/dL and the mean glycosylated hemoglobin (HbA1C) was found to be 8.0 (S.D=1.92).

TABLE 1 – DESCRIPTIVE VARIABLES

	N	Minimum	Maximum	Mean	Std. Deviation
Age	300	32	88	58.78	10.14
Duration of diabetes	300	1	35	8.90	5.78
Age of onset of diabetes	300	28	68	50.01	7.27
BMI	300	18.90	44.20	24.17	2.76
W/H ratio	300	.80	1.40	0.92	0.08
FBS	300	68	344	137.30	43.74
PPBS	300	88	484	198.69	69.01
HBA1C	300	5.40	16.20	8.0001	1.92

TABLE2: AGE DISTRIBUTION

Age Group	No. Of Cases	Percentage
31-40 years	13	4.3%
41-50 years	50	16.7%
51-60 years	104	34.7%
61-70 years	98	32.7%
Above 70 years	35	11.7%
Total	300	100.0%

13 cases belonged to the age group of 31 to 40 years, 50 cases belonged to the age group of 41 to 15 years, 104 cases belonged to the age group of 51 to 60 years, 98 cases belonged to the age group of 61 to 70 years, and 35 cases belonged to the age above 70 years. The mean age of our study population was 58.78±10.14 years.

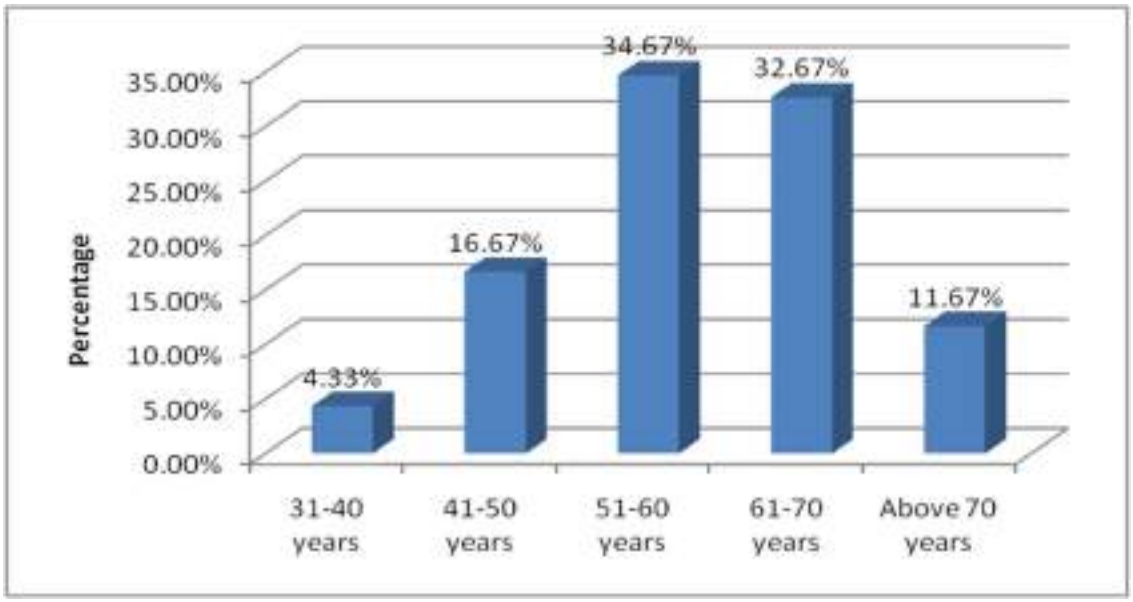

FIGURE 1: AGE DISTRIBUTION

TABLE 3: SEX DISTRIBUTION

Gender	No. of cases	Percentage
Female	130	43.3%
Male	170	56.7%
Total	300	100.0%

Out of 300 study participants there were 130 females and 170 males.

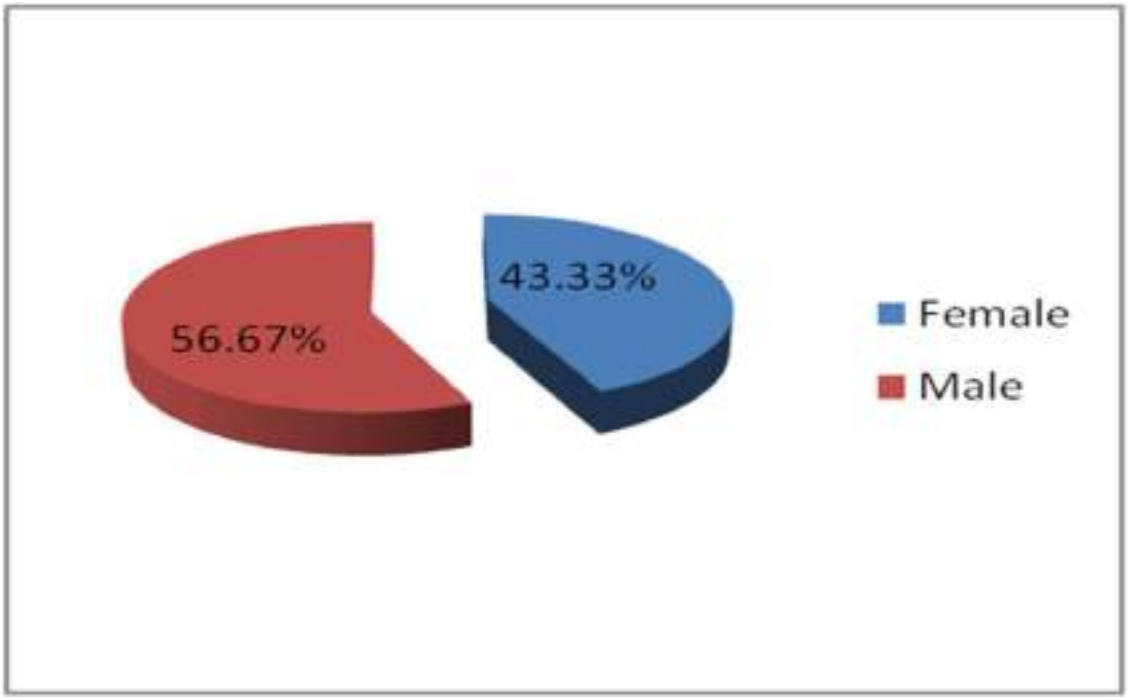

FIGURE 2: SEX DISTRIBUTION

TABLE 4: SPECTRUM OF JOINT INVOLVEMENT IN STUDY GROUP

Joint involvement	No. of cases	Percentage
Joint pain	82	27.3%
Joint swelling	22	7.3%
Restriction of movements at the joints	55	18.3%

Among all the study participants, joint pain was seen in 82 cases, joint swelling was observed in 22 cases and the restriction of movements at the joints was seen in 55 cases.

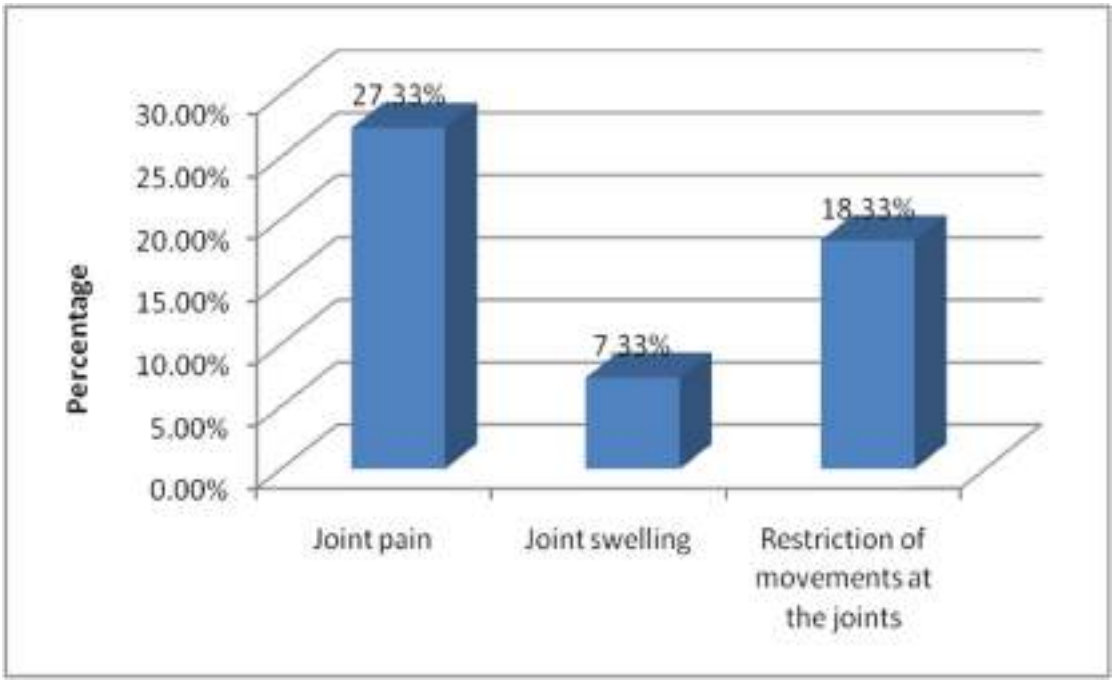

FIGURE 3: SPECTRUM OF JOINT INVOLVEMENT IN STUDY GROUP

TABLE 5: ASSOCIATED CO-MORBIDITES IN STUDY GROUP

History of	No. of cases	Percentage
Hypertension	91	30.3%
CAD	10	3.3%
Hypothyroidism	8	2.7%
Knee Replacement	1	0.3%

All the cases (n=300) had a past history of diabetes mellitus, 91 cases had a history of hypertension, 10 cases had a history of coronary artery disease, 8 cases had a history of hypothyroidism and one study participant had undergone knee replacement in the past.

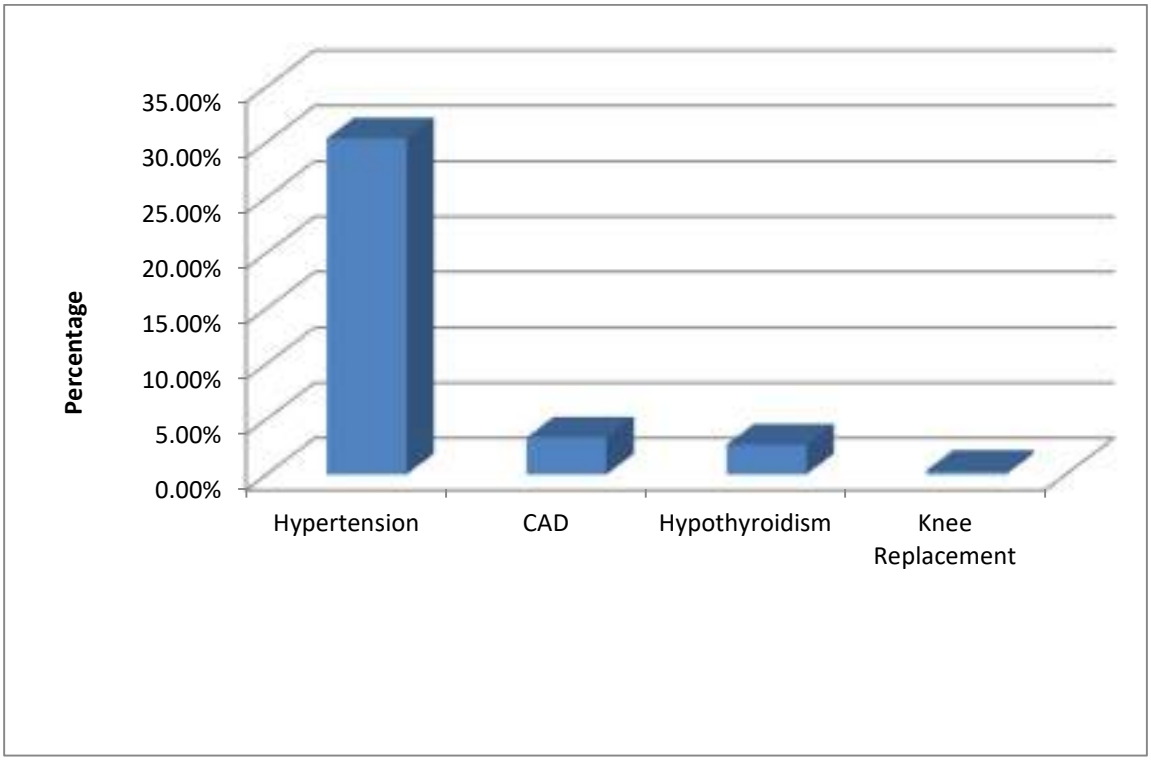

FIGURE 4: ASSOCIATED CO-MORBIDITES IN STUDY GROUP

MODE OF TREATMENT:

TABLE 6: INSULIN AS A MODE OF TREATMENT

Insulin as treatment	No. of cases	Percentage
Yes	42	13.67%
No	258	86.33%
Total	300	100.0%

42 (13.67%) cases were taking insulin for the treatment of diabetes mellitus.

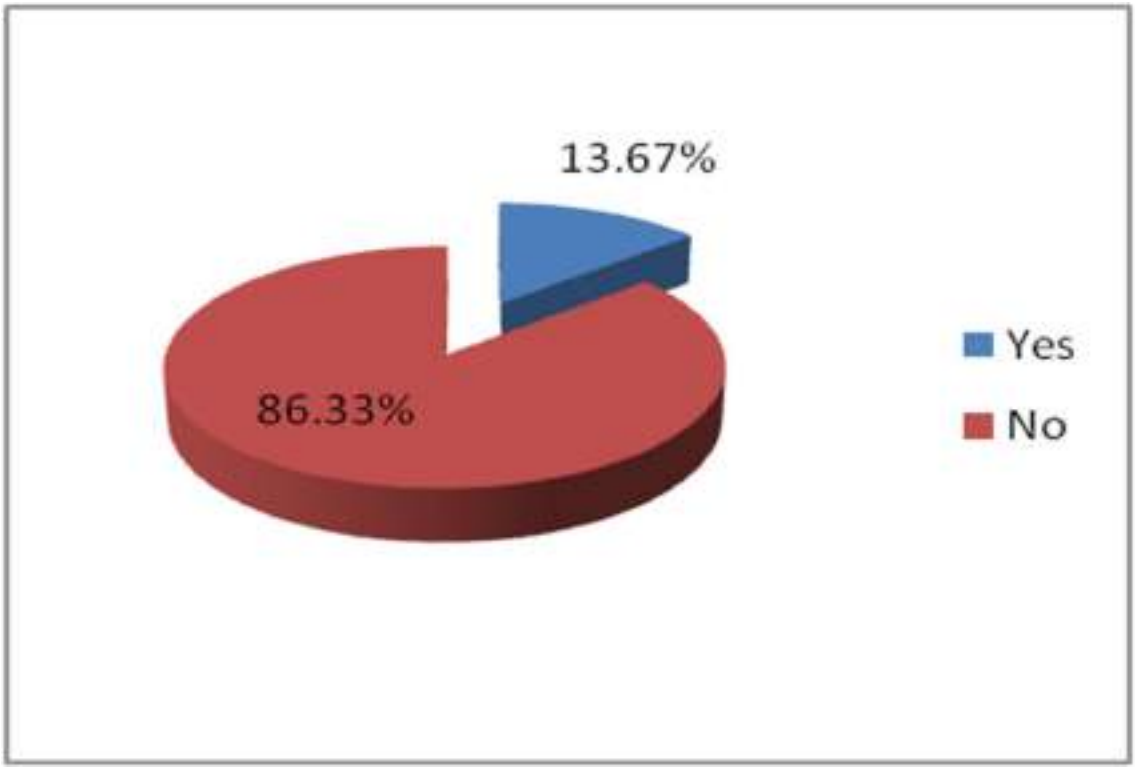

FIGURE 5: INSULIN AS A MODE OF TREATMENT

TABLE7: OHA AS A MODE OF TREATMENT

OHA as treatment	No. of cases	Percentage
No	10	2.0%
Yes	290	98.0%
Total	300	100.0%

290 cases (98%) were taking oral hypoglycaemic drugs for the management of diabetes mellitus

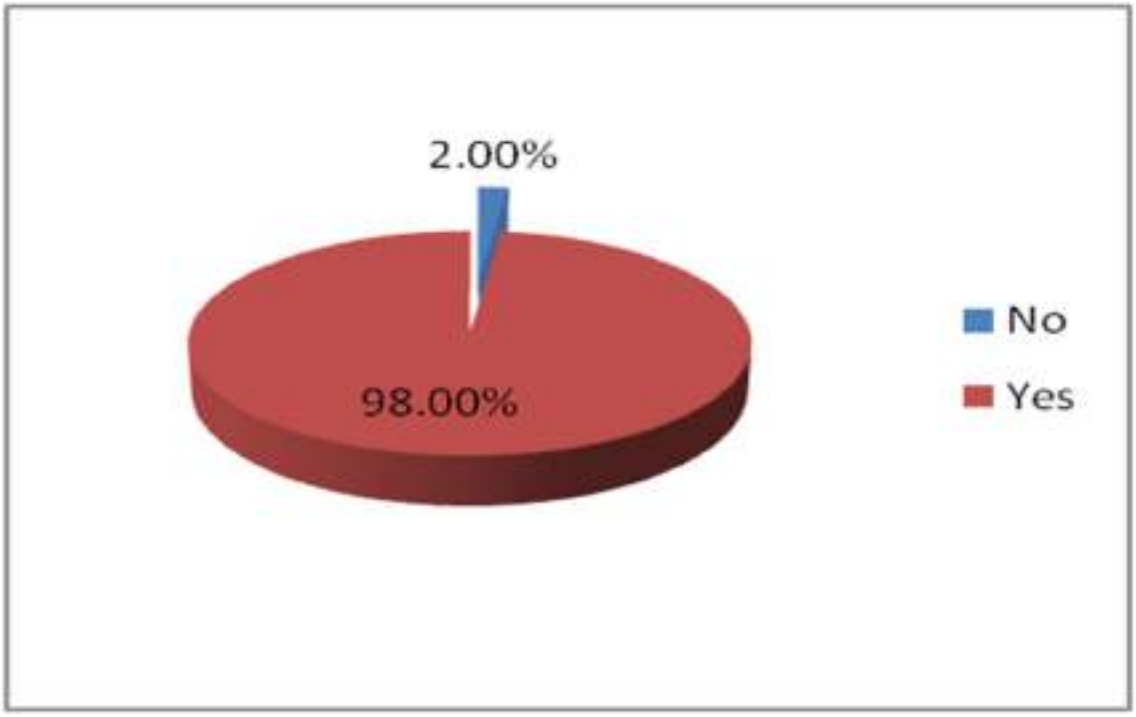

FIGURE 6: OHA AS A MODE OF TREATMENT

TABLE8: CORRELATION WITH FAMILY HISTORY OF DIABETES

Personal history	No. of cases	Percentage
Family history of Diabetes	65	21.7%
No	235	78.3%

Only 65 cases had a family history of diabetes mellitus.

TABLE9: DURATION OF DIABETES IN STUDY GROUP

Duration of diabetes group (years)	No. of cases	Percentage
< 5	57	19.0%
5-10	164	54.7%
11-15	40	13.3%
16-20	24	8.0%
> 20	15	5.0%

Out of 300 study participants, majority of the study participants (n=164) had diabetes for 5 to 10 years, followed by those who had duration of diabetes less than 5 years .40 study participants had duration of diabetes between 11 to 15 years, whereas 24 study participants had duration of diabetes > 20 years.Mean duration of diabetes was 8.9 (S.D= 5.78). Most of the diabetics with rheumatological manifestations noted to have 5 to 10 years of duration .

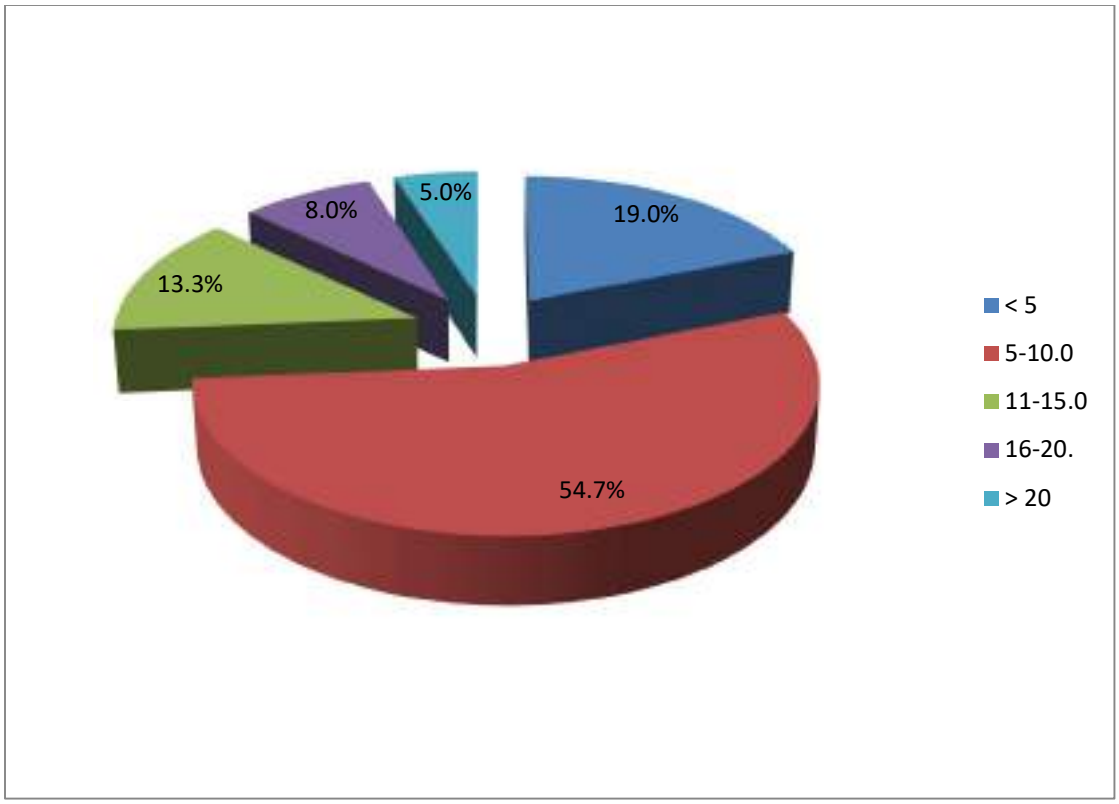

FIGURE 7: DURATION OF DIABETES IN STUDY GROUP

TABLE 10: CORRELATION OF RHEUMATOLOGICAL MANIFESTATIONS WITH DURATION OF DIABETES

	Rheumatological manifestations						
Duration of diabetes	N		Y		Total	Chi-square value	p-value
< 5	32	56.1%	25	43.9%	57	27.956	0.0001
5-10.0	88	53.7%	76	46.3%	164		
11-15.0	20	50.0%	20	50.0%	40		
> 15	8	20.5%	31	79.5%	39		
Total	148	49.3%	152	50.7%	300		

As the duration of diabetes increases, prevalence of rheumatological manifestations increases

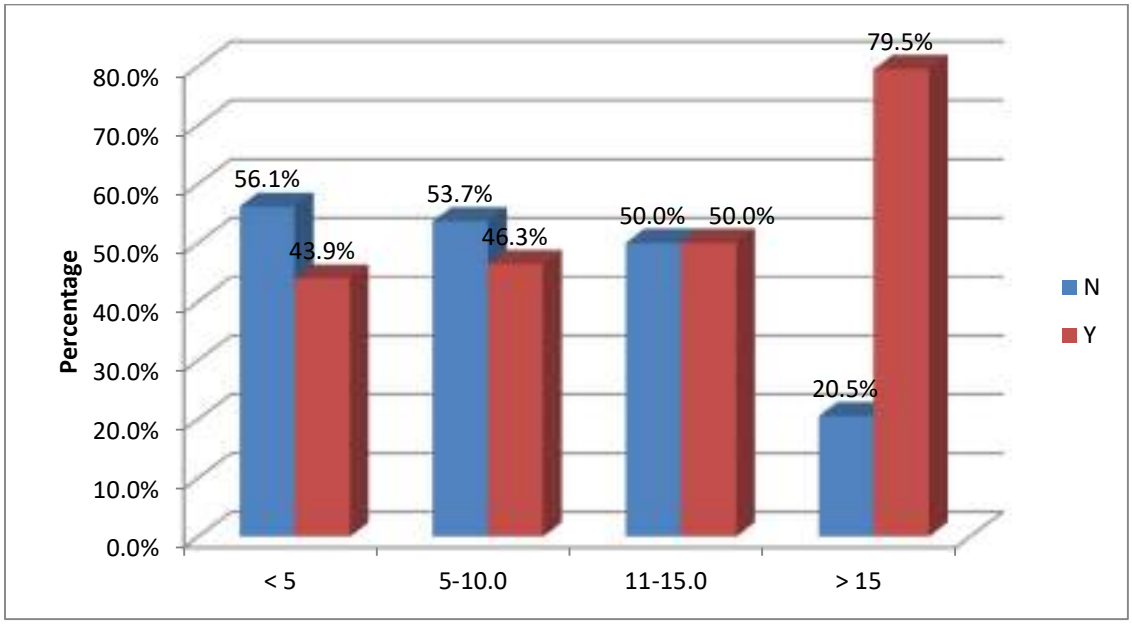

FIGURE8: CORRELATION OF RHEUMATOLOGICAL MANIFESTATIONS WITH DURATION OF DIABETES

TABLE 11: FINDINGS ON JOINT EXAMINATION

Joint examination	No. of cases	Percentage
Kanavel Sign Positive	7	2.7%
Tinel/Phalen Sign Positive	32	10.6%

On doing the joint examination, Kanavel sign was positive in 7 cases whereas Tinel/Phelan test was positive in 32 cases.

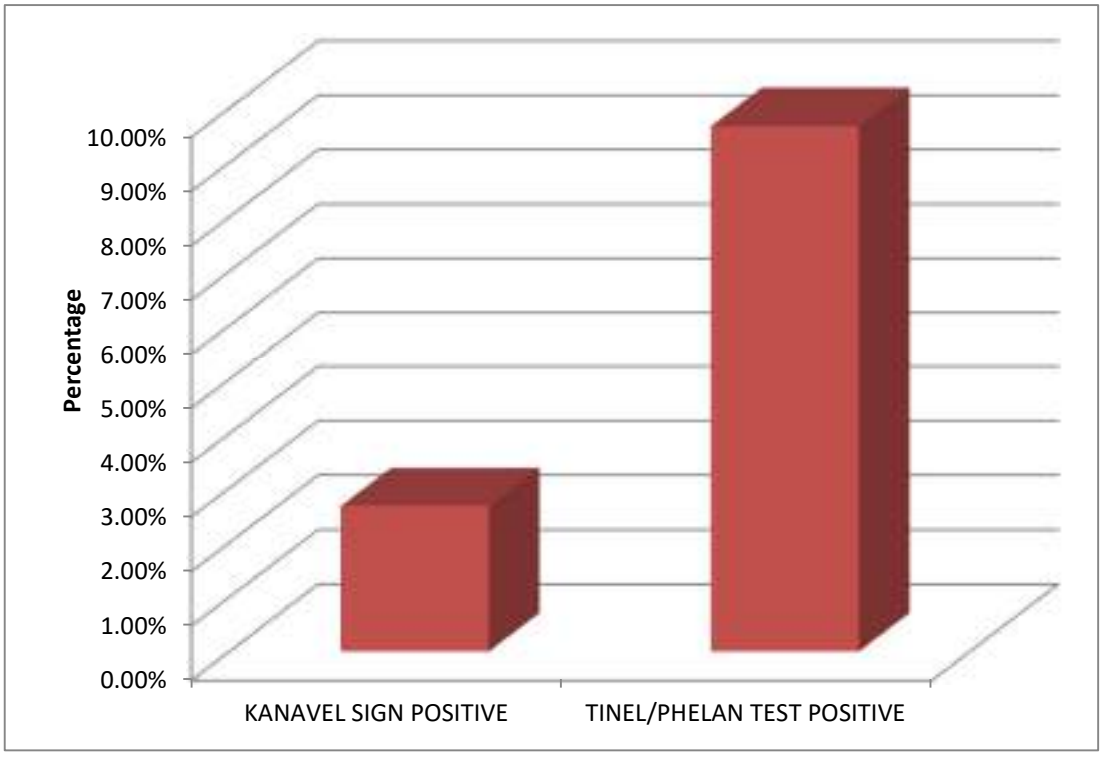

FIGURE 9: FINDINGS ON JOINT EXAMINATION

TABLE 12: TYPE OF JOINT INVOLVED

Joint involved	No. of cases	Percentage
Hand	12	4%
Left Index Finger	1	0.3%
Right Middle Finger	1	0.3%
Right Index Finger	3	1.0%
Right Upper Limb	2	0.7%
Left Middle Finger	2	0.66%
Spine	22	7.7%
Shoulder	23	7.7%
Wrist	28	9.3%
Knee	61	20.3%

In 12 cases hand was involved, in 1 case each left index finger and right middle finger was involved, in 3 cases right index finger was involved, in 2 cases right upper limb, 2 cases in left middle finger, in 22 cases spine, in 23 cases shoulder, in 28 cases wrist, and in 61 cases knee joint was involved.

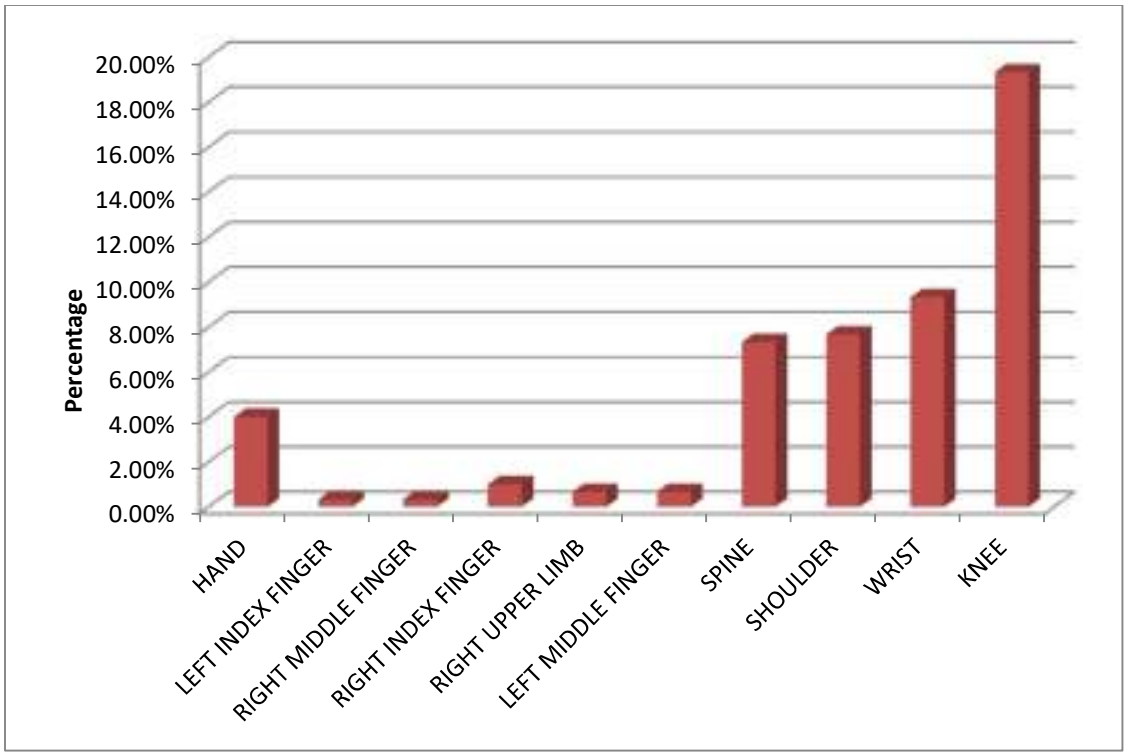

FIGURE10: TYPE OF JOINT INVOLVED

TABLE 13: PREVALENCE OF RHEUMATOLOGICAL MANIFESTATIONS IN OUR STUDY

Rheumatological manifestations	No. of cases	Percentage
Yes	152	50.7%
No	148	49.3%
Total	300	100.0%

In our study, rheumatological manifestations were seen in 152 diabetics (50.7%).

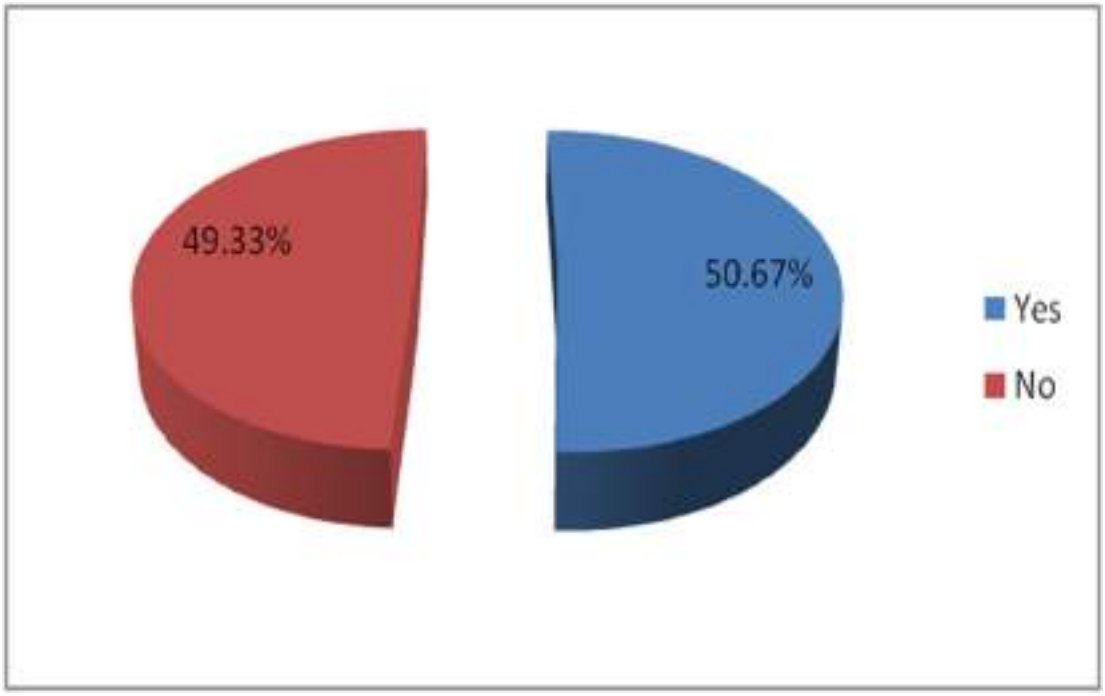

FIGURE 11: PREVALENCE OF RHEUMATOLOGICAL MANIFESTATIONS IN OUR STUDY

TABLE 14: TYPE OF RHEUMATOLOGICAL MANIFESTATION SEEN IN STUDY GROUP

Rheumatological Manifestations	No. of cases	Percentage
Adhesive capsulitis	25	8.3%
Carpal tunnel syndrome	32	10.7%
Dupuytren's contracture	2	0.7%
Diabeticcheiroarthopathy/limited joint mobility	18	6.0%
Flexor tenosynovitis/trigger finger	7	2.3%
Diffuse Idiopathic Skeletal Hyperostosis(DISH)	22	7.3%
Osteoarthritis	61	20.3%
Rheumatoid Arthritis	0	0.0%

Among the rheumatological manifestations 25 cases were suffering from Adhesive capsulitis, 32 cases was suffering from Carpal tunnel syndrome, 2 cases were suffering from the Dupuytren's contracture, 18 cases was suffering from Diabetic cheiroarthropathy/ limited joint mobility, 7 cases were suffering from Flexor tenosynovitis/trigger finger, 22 cases were suffering from Diffuse Idiopathic Skeletal Hyperostosis (DISH), and 61 cases were suffering from osteoarthritis. No case of rheumatoid arthritis was seen, while some of the cases were presenting with more than one rheumatological manifestation.

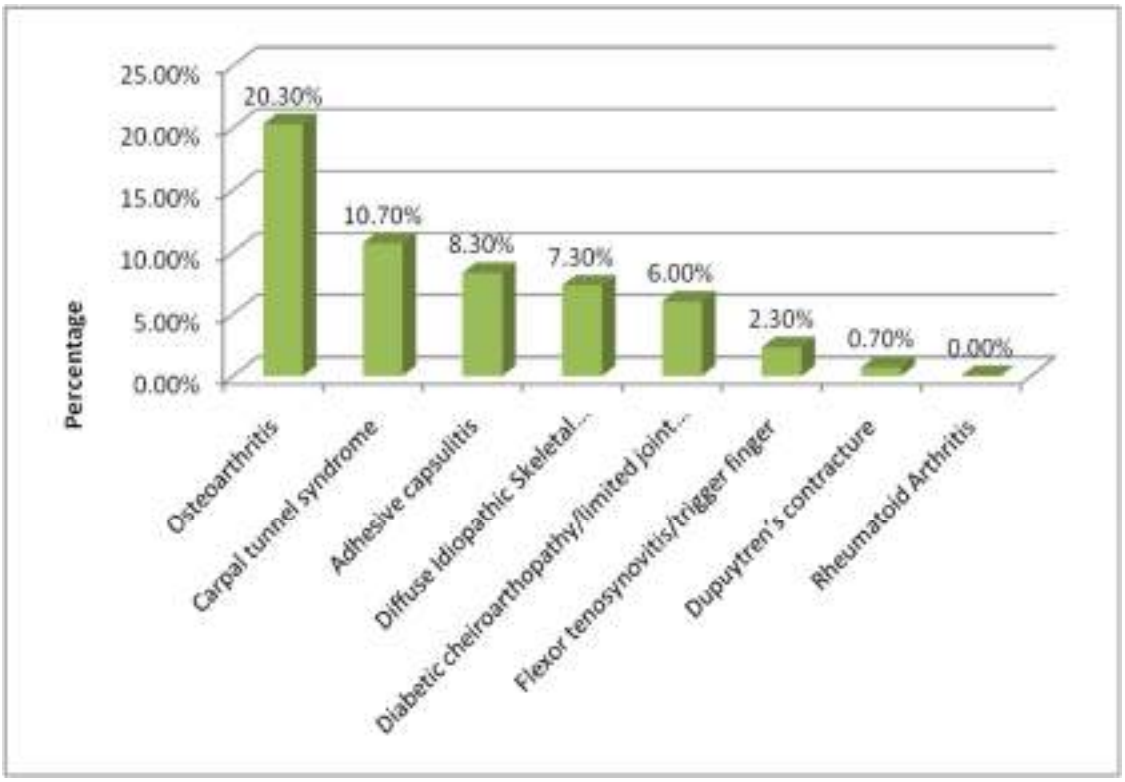

FIGURE 12: TYPE OF RHEUMATOLOGICAL MANIFESTATION SEEN IN STUDY GROUP

TABLE NO 15: ASSOCIATION OF FAMILY HISTORY WITH RHEUMATOLOGICAL MANIFESTATIONS IN DIABETES

			Rheumatological manifestations		Total	
			No	Yes		P value
Family history of diabetes	NO	Count	125	110	235	0.011
		Percentage	84.5%	72.4%	78.3%	
	YES	Count	23	42	65	
		Percentage	15.5%	27.6%	21.7%	

21.7% of the study participants with rheumatological manifestations had a family history of diabetes mellitus. 42 out of 65 study participants with rheumatological manifestations had a family history diabetes which was statistically significant (p = 0.011).

TABLE 16: CORRELATION OF BMI WITH RHEUMATOLOGICAL MANIFESTATIONS IN DIABETES

	Rheumatological manifestations				Total	Chi-square value	p-value
BMI GROUP	No		Yes				
18.9-22.9	58	39.2%	42	27.6%	100	6.972	0.031
23-24.9	51	34.5%	50	32.9%	101		
> 25	39	26.4%	60	39.5%	99		
Total	148	100.0%	152	100.0%	300		

It was found that the rheumatological manifestations were increased with BMI > 25 Kg/$m^2$and this correlation with increase in BMI was found to be statistically significant.

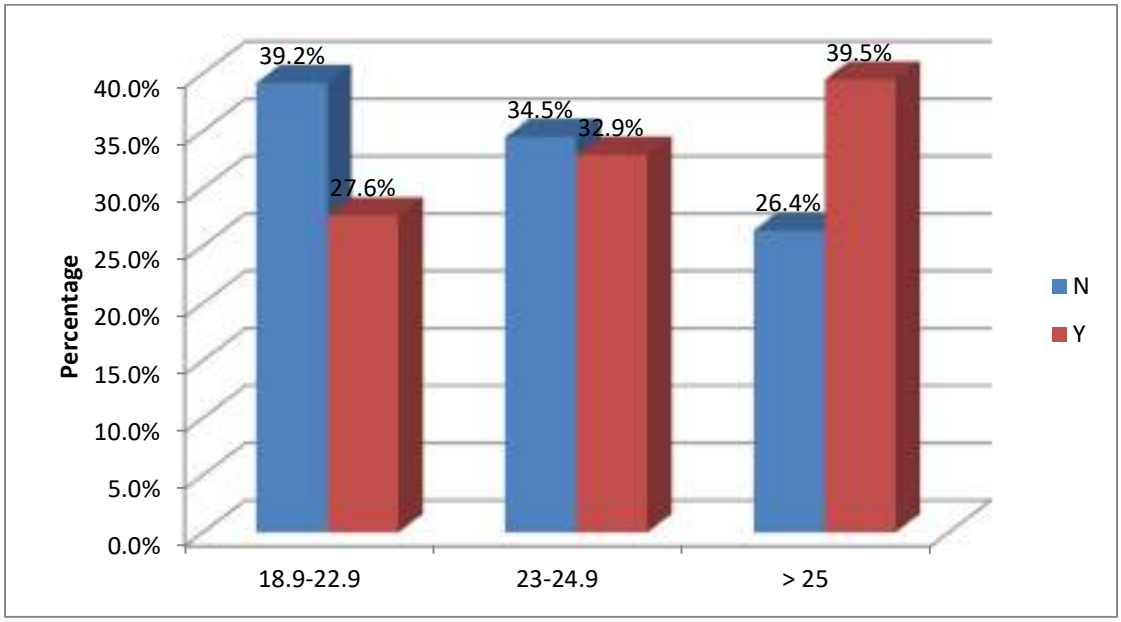

FIGURE NO 13: CORRELATION OF BMI WITH RHEUMATOLOGICAL MANIFESTIONS IN DIABETES

TABLE17: CORRELATION OF HBA1C LEVELS AND RHEUMATOLOGICAL MANIFESTATIONS IN DIABETES

HBA1C GROUP	Rheumatological Manifestations				Total	Chi-square value	p-value
	N		Y				
< 7	66	44.6%	55	36.2%	121	10.345	0.005
7.1-8	34	23.0%	21	13.8%	55		
> 8	48	32.4%	76	50.0%	124		
Total	148	100.0%	152	100.0%	300		

It was also seen that the rheumatologic manifestations were increased with poor glycemic control, and this association was found to be statistically significant. (p= 0.006)

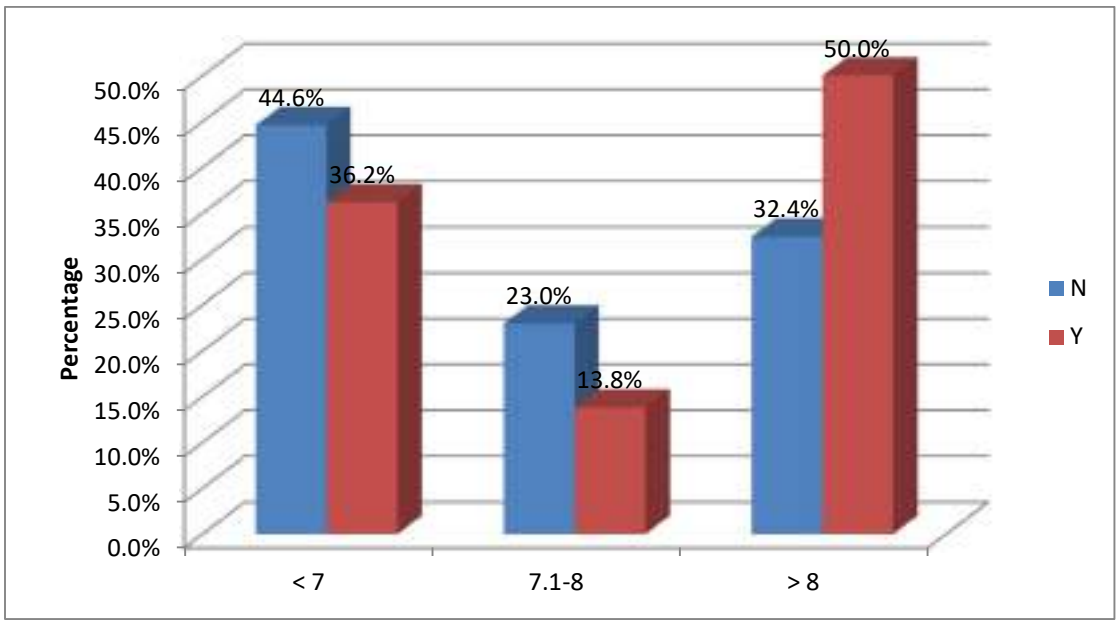

FIGURE 14: CORRELATION OF HBA1C LEVELS AND RHEUMATOLOGICAL MANIFESTATIONS IN DIABETES

TABLE18: CORRELATION OF HYPERTENSION WITH RHEUMATOLOGICAL MANIFESTATIONS IN DIABETES

Hypertension		Rheumatological manifestations		Total	P value
		N	Y		
NO	Count	116	84	200	<0.001
	Percentage	78.4%	55.3%	66.7%	
YES	Count	32	68	100	
	Percentage	21.6%	44.7%	33.3%	
Total	Count	148	152	300	
	Percentage	49.3%	50.7%	100.0%	

Out of all the study participants with Rheumatologic manifestations, 44.7% of the study participants had hypertension. The association was found to be statistically significant (p<0.001)

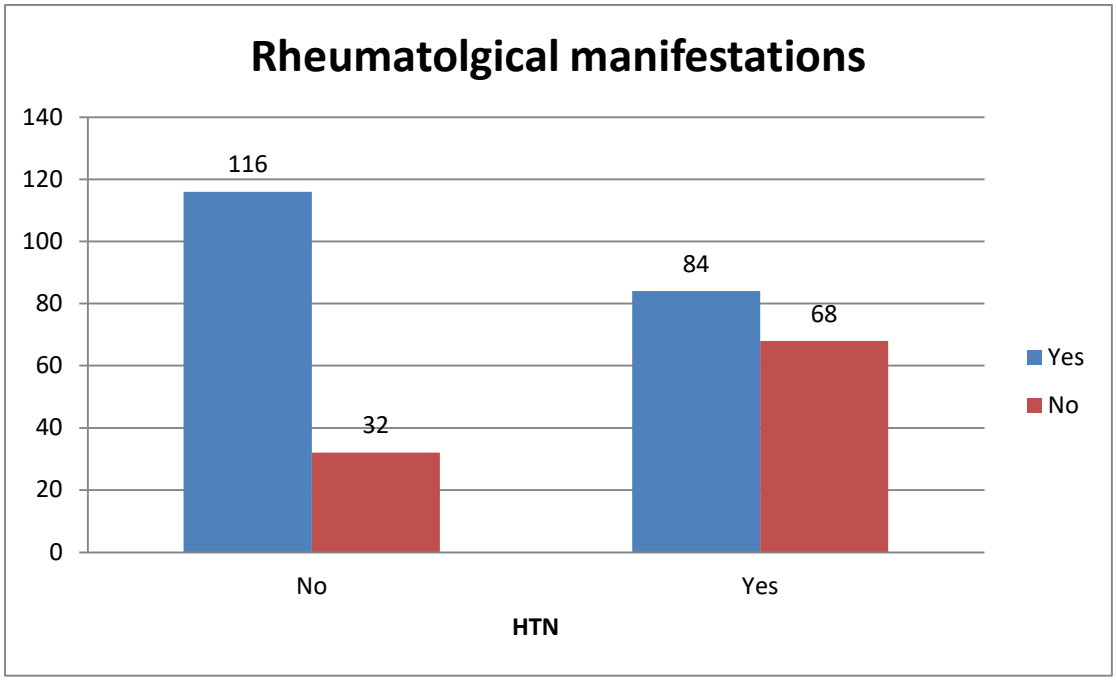

FIGURE 15: CORRELATION OF HYPERTENSION WITH RHEUMATOLOGICAL MANIFESTATIONS IN DIABETES

ASSOCIATION OF WAIST HIP RATIO and RHEUMATOLOGICAL MANIFESTATIONS BASED ON GENDER

TABLE19: ASSOCIATION OF WAIST HIP RATIO and ADHESIVE CAPSULITIS IN FEMALES

Females	**Adhesive capsulitis**				
WAIST HIP RATIO	**No**	**Yes**	**Total**	**OR**	**P VALUE**
Normal	16	0	16	---	0.35
Col%	13.45%	0.00%	12.31%		
Abnormal	103	11	114		
Col%	86.55%	100.00%	87.69%		
TOTAL	119	11	130		
Col%	100.00%	100.00%	100.00%		

All female participants with adhesive capsulitis had an abnormal W/H ratio. (p=0.35)

TABLE 20: ASSOCIATION OF WAIST HIP RATIO and ADHESIVE CAPSULITIS IN MALES

Males	Adhesive capsulitis				
WAIST HIP RATIO	**No**	**Yes**	**Total**	**OR**	**P VALUE**
Normal	125	8	133	3.02 (0.97-9.35)	0.08
Col%	80.13%	57.14%	78.24%		
Abnormal	31	6	37		
Col%	19.87%	42.86%	21.76%		
TOTAL	156	14	170		
Col%	100.00%	100.00%	100.00%		

57.1% of the male participants with adhesive capsulitis had normal W/H ratio which statistically significant(p=0.08)

TABLE 21: ASSOCIATION OF WAIST OVER HIP RATIO AND CARPAL TUNNEL SYNDROME IN FEMALES

Females	Carpal tunnel syndrome				
WAIST HIP RATIO	**No**	**Yes**	**Total**	**OR**	**P VALUE**
Normal	14	2	16	1.58 (0.33-7.48)	0.74
Col%	13.08%	8.70%	12.31%		
Abnormal	93	21	114		
Col%	86.92%	91.30%	87.69%		
TOTAL	107	23	130		
Col%	100.00%	100.00%	100.00%		

91.3% of the female study participants with carpal tunnel syndrome had abnormal waist to hip ratio which was statistically insignificant (p=0.74)

TABLE22: ASSOCIATION OF WAIST OVER HIP RATIO AND CARPAL TUNNEL SYNDROME IN MALES

Males	Carpal tunnel syndrome				
WAIST HIP RATIO	**No**	**Yes**	**Total**	**OR**	**P VALUE**
Normal	125	8	133	0.43 (0.05-3.58)	0.68
Col%	77.64%	88.89%	78.24%		
Abnormal	36	1	37		
Col%	22.36%	11.11%	21.76%		
TOTAL	161	9	170		
Col%	100.00%	100.00%	100.00%		

88.9% of the male study participants with carpal tunnel syndrome had a normal waist to hip ratio which was statistically insignificant (p=0.68).

TABLE 23: ASSOCIATION OF DIABETIC CHEIROARTHOPATHY/LIMITED JOINT MOBILITY WITH WAIST HIP RATIO IN FEMALES

Females	Diabetic cheiroarthopathy/limited joint mobility				
WAIST HIP RATIO	**No**	**Yes**	**Total**	**OR**	**P VALUE**
Normal	16	0	16	---	0.596
Col%	13.01%	0.00%	12.31%		
Abnormal	107	7	114		
Col%	86.99%	100.00%	87.69%		
TOTAL	123	7	130		
Col%	100.00%	100.00%	100.00%		

All of the female study participants with had an abnormal waist to hip ratio which was statistically insignificant (p=0.596)

TABLE 24: ASSOCIATION OF DIABETIC CHEIROARTHOPATHY/LIMITED JOINT MOBILITY WITH WAIST HIP RATIO IN MALES

Males	Diabetic cheiroarthopathy/limited joint mobility		Total	OR	P VALUE
WAIST HIP RATIO	No	Yes			
Normal	123	10	133	0.34 (0.04-2.75)	0.459
Col%	77.36%	90.91%	78.24%		
Abnormal	36	1	37		
Col%	22.64%	9.09%	21.76%		
TOTAL	159	11	170		
Col%	100.00%	100.00%	100.00%		

90.1% of the male study participants with diabetic cheiroarthropathy had an a normal waist to hip ratio which was statistically insignificant (p=0.459)

TABLE 25: ASSOCIATION OF WAIST OVER HIP RATIO AND DIABETIC DIFFUSE IDIOPATHIC SKELETAL HYPEROSTOSIS(DISH) IN FEMALES

Females	Diffuse Idiopathic Skeletal Hyperostosis (DISH)		Total	OR	P VALUE
WAIST HIP RATIO	**No**	**Yes**			
Normal	16	0	16	---	1.00
Col%	12.60%	0.00%	12.31%		
Abnormal	111	3	114		
Col%	87.40%	100.00%	87.69%		
TOTAL	127	3	130		
Col%	100.00%	100.00%	100.00%		

100% of the female study participants with DISH had an abnormal waist to hip ratio which was statistically insignificant (p=1.00)

TABLE 26: ASSOCIATION OF WAIST HIP RATIO WITH DIFFUSE IDIOPATHIC SKELETAL HYPEROSTOSIS (DISH) IN MALES

Males	**Diffuse Idiopathic Skeletal Hyperostosis (DISH)**				
WAIST HIP RATIO	**No**	**Yes**	**Total**	**OR**	**P VALUE**
Normal	117	16	133	0.64 (0.17-2.34)	0.77
Col%	77.48%	84.21%	78.24%		
Abnormal	34	3	37		
Col%	22.52%	15.79%	21.76%		
TOTAL	151	19	170		
Col%	100.00%	100.00%	100.00%		

84.2% of the male study participants with DISH had an a normal waist to hip ratio which was statistically insignificant (p=0.77)

TABLE 27: ASSOCIATION OF WAIST AND HIP RATIO WITH DUPUYTREN CONTRACTURE IN FEMALES

Females	Dupuytren contracture				
WAIST HIP RATIO	**No**	**Yes**	**Total**	**OR**	**P VALUE**
Normal	15	1	16	0.13 (0.01-2.23)	0.232
Col%	11.72%	50.00%	12.31%		
Abnormal	113	1	114		
Col%	88.28%	50.00%	87.69%		
TOTAL	128	2	130		
Col%	100.00%	100.00%	100.00%		

50% of the female study participants with Dupuytren contracture had an abnormal waist to hip ratio which was statistically insignificant (p=0.232)

TABLE 28: ASSOCIATION OF WAIST AND HIP RATIO WITH DUPUYTREN';S CONTRACTURE IN MALES

Males	Dupuytren';s contracture				
WAIST HIP RATIO	**No**	**Yes**	**Total**	**OR**	**P VALUE**
Normal	133	0	133	---	---
Col%	78.24%	NaN%	78.24%		
Abnormal	37	0	37		
Col%	21.76%	NaN%	21.76%		
TOTAL	170	0	170		
Col%	100.00%	100.00%	100.00%		

None of the male study participants had Dupuytren';s contracture.

TABLE 29: ASSOCIATION OF WAIST AND HIP RATIO WITH FLEXOR TENOSYNOVITIS/TRIGGER FINGER IN FEMALES

Females	Flexor tenosynovitis/trigger finger				
WAIST HIP RATIO	**No**	**Yes**	**Total**	**OR**	**P VALUE**
Normal	16	0	16	0.89 (0.09-8.26)	0.768
Col%	12.50%	0.00%	12.31%		
Abnormal	112	2	114		
Col%	87.50%	100.00%	87.69%		
TOTAL	128	2	130		
Col%	100.00%	100.00%	100.00%		

All of the female study participants with flexor tenosynovitis had an abnormal waist to hip ratio which was statistically insignificant (p=0.768)

TABLE 30:ASSOCIATION OF WAIST AND HIP RATIO WITH FLEXOR TENOSYNOVITIS/TRIGGER FINGER IN MALES

Males	Flexor tenosynovitis/trigger finger		Total	OR	P VALUE
WAIST HIP RATIO	**No**	**Yes**			
Normal	16	0	16	0.89 (0.09-8.26)	0.768
Row%	100.00%	0.00%	100.00%		
Col%	12.50%	0.00%	12.31%		
Abnormal	112	2	114		
Row%	98.25%	1.75%	100.00%		
Col%	87.50%	100.00%	87.69%		
TOTAL	128	2	130		
Row%	98.46%	1.54%	100.00%		
Col%	100.00%	100.00%	100.00%		

All of the male study participants with flexor tenosynovitis had an abnormal waist to hip ratio which was statistically insignificant (p=0.768)

TABLE 31: ASSOCIATION OF WAIST AND HIP RATIO WITH OSTEOARTHRITIS IN FEMALES

Females	Osteoarthritis		Total	OR	P VALUE
WAIST HIP RATIO	No	Yes			
Normal	15	1	16	3 (0.37-24.09)	0.46
Col%	13.64%	5.00%	12.31%		
Abnormal	95	19	114		
Col%	86.36%	95.00%	87.69%		
TOTAL	110	20	130		
Col%	100.00%	100.00%	100.00%		

95% of the female study participants with osteoarthritis had an abnormal waist to hip ratio which was statistically insignificant (p=0.46)

TABLE 32: ASSOCIATION OF WAIST AND HIP RATIO WITH OSTEOARTHRITIS IN MALES

Males	Osteoarthritis		Total	OR	P VALUE
WAIST HIP RATIO	**N**	**Y**			
Normal	98	35	133	0.54 (0.21-1.41)	0.21
Col%	75.97%	85.37%	78.24%		
Abnormal	31	6	37		
Col%	24.03%	14.63%	21.76%		
TOTAL	129	41	170		
Col%	100.00%	100.00%	100.00%		

85.4% of the male study participants with osteoarthritis had a normal waist to hip ratio which was statistically insignificant (p=0.21)

DISCUSSION

The current study was a cross sectional study that was conducted for a period of one and a half year from January 2020 to June 2021. It included 300 patients with Diabetes Mellitus (both type 1 and type 2) presented in medicine and endocrinology OPD in Dayanand Medical College & Hospital, Ludhiana. For most of these affections, pathophysiologic correlations are not well established.[40] Some of them, such as diabetic cheiroarthropathy, neuropathic arthritis, diabetic amyotrophy, diabetic muscle infraction, are considered intrinsic complications of DM.[41] For others, like diffuse idiopathic skeletal hyperostosis or reflex sympathetic dystrophy, DM is considered a predisposing condition.[42] Rheumatological disorders in the patient of diabetes are very common still these are neglected, but their prevalence is quite high in diabetic patients.[43]The musculoskeletal issues arising due to the different rheumatologic manifestations as a result of diabetes mellitus can cause pain and significant functional impairment that may result in non adherence to medications, and physiotherapy. These manifestations may be debilitating and might affect the quality of life of the patients.[44]

In the present study, the mean age of the study participants was 58.78 years. 34% of the study participants belonged to the age group between 51 and 60 years. Priyanka et al[45] noted that mean age of the study participants was 58.29 years and the most common age distribution of the study participants was between 51 and 60 years. This finding is in concordance with our study. A study conducted by Kannan et al[46] observed that the mean age of the study participants was 53.15 years. Kumar et al[47] observed that the mean age of the study participants was 55.43 years.

In the present study there were 56.7% of the males. Kannan et al[46] observed that the majority of the study participants were females, which is not in concordance with our study. However, Priyanka et reported that there were 63.3% of the males in the study. Kumar et al[47] also noted that the majority of the study participants were males (57.5%).

In the present study, the mean age of the onset of diabetes was 50.01 years and the mean duration of diabetes was 8.90 years. Priyanka et al[45] also noted that that the mean duration of diabetes among the study participants was 8.6 years. Kannan et al[46] observed that the mean duration of diabetes among the study participants was 7.2 years.

In this study, out of all study participants, majority of the study participants (54.7%) had diabetes for 5 to 10 years, followed by those who had duration of diabetes less than 5 years (19%). 13.3% of the study participants had duration of diabetes between 11 and 15 years, whereas of the study participants had duration of diabetes more than years. Kannan et al[46] noted that among all the study participants (n=200), majority of the study participants had a duration of diabetes less than 5 years, followed by those who had a duration of diabetes between 5 and 10 years, and there were the least study participants who had a duration of diabetes more than 10 years. Kumar et al[47] noted that the odds of having the rheumatological manifestations was 1.48 times in the study participants who had a duration of diabetes more than 5 years as compared to those who had a duration of diabetes less than 5 years, which is consistent with our study.

The mean BMI of the study participants in the present study was 24.17 Kg/m^2. The mean waist to hip ratio of the study participants in the present study was 0.92.In the present study there was a poor glycemic control as depicted by mean HbA1C to be 8%.

In the present study joint involvement was seen in 27% of the patients while joint swelling was observed in 7.3% of the patients. Restricted movement of joints was seen in 18% of the patients.

Out of all the study participants, the prevalence of rheumatologic manifestations was found to be 50.7%. Out of these, the most common manifestation was found to be Osteoarthritis (20.3%) followed by carpal tunnel syndrome (10.7%), Adhesive capsulitis (8.3%), Diffuse Idiopathic Skeletal Hyperostosis (7.3%),

Diabetic Cheiroarthropathy (6%), Flexor tenosynovitis (2.3%) and Dupuytren's contracture (0.7%). The results were comparable to the studies conducted by Mathew AJ et al[48] and Sarkar et al[49] which showed the prevalence of osteoarthritis knee to be 20.4% and 22.5%, respectively.In the study conducted by Kannan et al[46], the prevalence of rheumatologic manifestations was found to be 36% out of which the most common rheumatologic diagnosis was that of limited joint mobility (19%) followed by Adhesive capsulitis (11%) and others. Priyanka et al[45] observed that the prevalence of rheumatologic manifestations among the diabetics was 42.5% and that Diabetic Cheiroarthropathy (29.4%) was the most common rheumatologic manifestation among them. Kumar et al[47] noted a prevalence of 53.3% of rheumatological manifestations among all the diabetic patients, out of which the most common rheumatologic manifestation as Osteoarthritis (50%) followed by Adhesive capsulitis (45.31%), Diabetic Cheiroarthropathy (37.5%) and Carpal tunnel syndrome (37.5%). A study conducted by Ravi Kumar et al observed that the prevalence of rheumatological manifestations was 31% which is not in similar lines with our study.[50]The study conducted by Singh et al[51] reported that the overall prevalence of rheumatological manifestations was 27% which is not consistent with our findings. However, the authors reported that the most common rheumatological manifestation found in their study was Osteoarthritis which is in concordance with our study.

21.7% of the study participants with rheumatological manifestations had a family history of diabetes mellitus 13.7% of the study participants were taking Insulin whereas 98% of the study participants were taking Oral hypoglycaemic agents. In the present study, all of the participants with rheumatologic manifestations were taking either oral hypoglycaemic drugs or insulin or both. Kannan et al[46] also noted that all of the study participants with rheumatologic manifestations were taking either oral hypoglycaemic drugs or insulin or both.

Most of the study participants having rheumatological manifestations (39.5%) were significantly overweight than the rest. Hence greater BMI was found to be

a risk factor for the presence of rheumatological manifestations. Kannan et al[46] noted that most of the study participants having rheumatologic manifestations were significantly overweight which is similar lines with our study. BMI greater than 25 Kg/m^2 was also found to be a risk factor for rheumatological manifestations in the study conducted by Kumar et al.[47]

Similarly, poor glycemic control was also a significant risk factor for the presence of rheumatological manifestations. Almost half of the study participants with rheumatological manifestations had HbA1C levels of more than 8. Kannan et al[46] observed that nearly 70% of the study participants with rheumatologic diagnosis had a poor glycemic control but was not statistically significant, hence not in similar lines with the findings of the present study. Priyanka et al[45] also observed that the majority of the study participants with rheumatological manifestations had a poor glycemic control. Similarly Kumar et al[47] also found poor glycemic control to be a risk factor for the development of rheumatological manifestations among the diabetics.

Nearly one-third of the study participants having rheumatological manifestations had a history of hypertension. The presence of hypertension was also a significant risk factor for rheumatologic manifestations. In the present study, we could not establish any association between waist to hip ratio and rheumatological manifestations.

In present study we could not found any case of rheumatoid arthritis which showed that rheumatoid arthritis is not rheumatological manifestation in diabetes per se.

From this study we conclude that a thorough musculoskeletal examination could be useful in detection of the rheumatological manifestations. This could be helpful in preventing chronic disability in patients and improving the quality of life. Glycemic control can also be helpful in prevention of these manifestations.

SUMMARY AND CONCLUTION

This is a clinical study of prevalence of rheumatological manifestations among patients with diabetes mellitus .There were 300 study participants in our study.. The following observations were noted in our study .

1. The mean age of the study participants was 58.78 (S.D=10.14) years with a range of 32 years to 88 years.
2. 13 cases belonged to the age group of 31 to 40 years, 50 cases belonged to the age group of 41 to 15 years, 104 cases belonged to the age group of 51 to 60 years, 98 cases belonged to the age group of 61 to 70 years, and 35 cases belonged to the age above 70 years.
3. Out of 300 study participants there were 130 females and 170 males ..
4. Most of the study population had 5 to 10 years of duration of disease .
5. The mean duration of diabetes was found to be 8.9 (S.D= 5.78) years.
6. The mean age of onset of diabetes was found to be 50 (S.D= 5.78) years.
7. The mean BMI of the study participants was 24.17 Kg/m^2ranging from a minimum of 18.9 $Kg/m^2$to a maximum of 44.20 Kg/m^2.
8. The mean waist to hip ratio was 0.92 (SD=0.08).
9. The mean fasting blood sugar was found to be 137.30 mg/dl,
10. The mean postprandial blood sugar was found to be 198.69 mg/dl and the mean glycosylated hemoglobin (hba1c) was found to be 8.0 (SD=1.92).

11. Among all the study participants, joint pain was seen in 82 cases, joint swelling was observed in 22 cases and the restriction of movements at the joints was seen in 55 cases.
12. All the cases (n=300) had a past history of diabetes mellitus, 91 cases had a history of hypertension, 10 cases had a history of coronary artery disease, 8 cases had a history of hypothyroidism and one study participant had undergone knee replacement in the past. There was no history of stroke, bronchial asthma, renal disease or liver disease.
13. 42 cases were taking insulin for the treatment of diabetes mellitus. 290

cases were taking oral hypoglycemic drugs for the management of diabetes mellitus.

14. 65 cases had a family history of diabetes mellitus.
15. Among the rheumatological manifestations 25 cases were suffering from Adhesive capsulitis, 32 cases was suffering from Carpal tunnel syndrome, 2 cases were suffering from the Dupuytren's contracture, 18 cases was suffering from Diabetic cheiroarthropathy/ limited joint mobility, 7 cases were suffering from Flexor tenosynovitis/trigger finger, 22 cases were suffering from Diffuse Idiopathic Skeletal Hyperostosis (DISH), and 61 cases were suffering from osteoarthritis. No case of rheumatoid arthritis was seen, while some of the cases were presenting with more than one rheumatological manifestation.
16. Both obesity and poor glycemic control are associated with increase risk for rheumatological menifestations

CONCLUSION

In our study proportionately higher prevalence of rheumatological complications were observed in patients with uncontrolled diabetes mellitus than among with good glycemic control. We recommended thorough evaluation for rheumatological complication along with macro and micro vascular complications as they are often missed and clinically overlooked. This study also highlights importance of various other risk factors for rheumatological manifestations such as duration of diabetes and obesity (BMI), duration, good glycemic control and treatment may reduce morbidity associated with rheumatological manifestation thereby improving quality of life in patients with diabetes. This could be helpful in preventing chronic disability in patients and improving their quality of life.

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Sr. No	MRD No	Age	Sex	Joint pain	Joint swelling	Restriction of movements at the joints	Past history	Duration of diabetes	Age of onset of diabetes	Insulin	OHA	Hypertension	Stroke	Bronchial Asthma	Cardiac illness	renal disease	liver disease	Family history of diabetes	History of smoking	alcohol consumption	BMI	W/H Ratio	Joint examination	Joint involved	Other joints	FBS
1	1025494	54	F	YES	NO	YES	DM	10	44	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	25.2	0.9	TINEL TEST, PHELAN TEST POSITVE	WRIST	NAD	144
2	942025	44	M	YES	NO	YES	DM	7	37	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	24	0.85	TINEL TEST POSITIVE	WRIST	NAD	156
3	692965	48	F	YES	NO	YES	DM	6	42	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	25.2	0.87	TINEL TEST, PHELAN TEST POSITVE	WRIST	NAD	188
4	1025542	51	F	YES	NO	YES	DM	10	41	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	21.2	0.84	TINEL TEST POSITIVE	WRIST	NAD	168
5	213814	70	M	YES	YES	YES	DM,CAD	21	49	NO	YES	YES	NO	NO	CAD	NO	NO	NO	NO	NO	22	0.87	RESTRICTED KNEE JOINT ROM	KNEE	NAD	130
6	1230341	56	M	NO	NO	NO	DM,HTN	18	38	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	26	1	RESTRICTED KNEE JOINT ROM	KNEE	NAD	100
7	1230344	58	M	YES	YES	YES	DM , HTN	8	50	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.9	0.96	RESTRICTED KNEE JOINT ROM	KNEE	NAD	112
8	1006272	39	F	YES	NO	YES	DM	3	36	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23	0.9	TINEL TEST POSITIVE	WRIST	NAD	122
9	622233	47	F	YES	NO	YES	DM	4	43	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26	1.1	TINEL TEST POSITIVE	WRIST	NAD	126
10	894016	65	M	YES	NO	YES	DM,HTN	13	52	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	27.6	1.3	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	105
11	894034	62	M	YES	NO	YES	DM	10	52	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26	0.85	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	113
12	893289	65	M	YES	NO	YES	DM	17	48	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	27	0.84	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	140
13	456289	57	M	YES	NO	YES	DM	4	53	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.2	0.9	NAD	NAD	NAD	126
14	642634	58	M	YES	NO	YES	DM	4	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25	0.94	NAD	NAD	NAD	118
15	820419	56	M	YES	NO	YES	DM	6	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26	0.98	NAD	NAD	NAD	102
16	1184266	40	F	YES	NO	YES	DM	3	37	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.6	0.86	NAD	NAD	NAD	116
17	680520	40	F	YES	NO	YES	DM	4	36	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.7	0.84	NAD	NAD	NAD	138
18	797412	62	F	YES	NO	YES	DM	6	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.7	0.87	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	154
19	648059	59	F	YES	NO	YES	DM	8	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.7	0.93	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	111
20	706283	56	F	YES	NO	YES	DM	6	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.8	0.89	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	100
21	1184169	54	F	YES	NO	YES	DM	5	49	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.5	0.85	NAD	NAD	NAD	124
22	706258	50	F	YES	NO	YES	DM	7	43	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22	0.88	NAD	NAD	NAD	148
23	714237	60	F	YES	NO	YES	DM	9	51	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.6	0.92	NAD	NAD	NAD	116
24	723842	45	M	YES	NO	YES	DM	4	41	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.5	0.99	NAD	NAD	NAD	123
25	731561	58	F	YES	NO	YES	DM, HYPOTHYROIDISM	7	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.6	0.87	RESTRICTED KNEE JOINT ROM	KNEE	NAD	112
26	731581	65	M	YES	NO	YES	DM	15	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.2	0.87	RESTRICTED KNEE JOINT ROM	KNEE	NAD	104
27	745000	75	M	YES	NO	YES	DM	15	60	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.7	0.89	RESTRICTED KNEE JOINT ROM	KNEE	NAD	108
28	742981	84	M	YES	NO	YES	DM,HTN	30	54	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	27.6	0.85	RESTRICTED KNEE JOINT ROM	KNEE	NAD	123
29	897089	70	F	YES	NO	YES	DM	20	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.6	0.91	RESTRICTED KNEE JOINT ROM	KNEE	NAD	112
30	527728	53	F	YES	NO	YES	DM	8	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.8	0.86	NAD	NAD	NAD	118
31	1132835	44	F	NO	NO	NO	DM	6	38	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.9	0.85	NAD	NAD	NAD	120
32	1147235	62	M	NO	NO	NO	DM , HYPERTENSION, HYPOTHYROIDISM	12	50	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	28	0.9	NAD	NAD	NAD	134
33	116634	67	M	YES	YES	YES	DM,HTN	20	47	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	23.9	0.85	RESTRICTED KNEE JOINT ROM	KNEE	NAD	120
34	380456	61	F	YES	YES	YES	DM, HYPOTHYROIDISM	15	46	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.4	0.97	RESTRICTED KNEE JOINT ROM	KNEE	NAD	107
35	1140441	65	F	YES	YES	YES	DM	15	40	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.9	0.96	RESTRICTED KNEE JOINT ROM	KNEE	NAD	105
36	68866	61	M	NO	NO	NO	DM	12	49	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.4	0.86	NAD	NAD	NAD	116
37	909970	50	M	NO	NO	NO	DM,CAD	6	44	NO	YES	NO	NO	NO	CAD	NO	NO	NO	NO	NO	26	0.98	NAD	NAD	NAD	140
38	927987	50	M	NO	NO	NO	DM	5	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	28.4	1.2	NAD	NAD	NAD	122
39	926979	55	M	NO	NO	NO	DM	10	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.4	0.86	NAD	NAD	NAD	113
40	651104	60	M	NO	NO	NO	DM	10	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.5	0.85	RESTRICTED KNEE JOINT ROM	KNEE	NAD	118
41	936357	72	F	YES	YES	YES	DM	21	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25	0.94	RESTRICTED KNEE JOINT ROM	KNEE	NAD	120
42	330280	66	M	NO	NO	NO	DM	12	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.2	1.1	NAD	NAD	NAD	122
43	712710	60	M	NO	NO	NO	DM	15	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.6	0.86	KNEE JOINT ROM	SPINE	NAD	133
44	951080	56	M	NO	NO	NO	DM,CAD	8	48	NO	YES	NO	NO	NO	CAD	NO	NO	NO	NO	NO	23.8	0.9	NAD	NAD	NAD	102
45	846012	32	F	NO	NO	NO	DM	2	30	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.6	0.94	NAD	NAD	NAD	118
46	768864	42	F	NO	NO	NO	DM	1	41	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.7	0.85	NAD	NAD	NAD	126
47	871578	48	F	NO	NO	NO	DM	3	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.8	0.96	NAD	NAD	NAD	113
48	872919	47	F	NO	NO	NO	DM	5	42	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.4	0.88	NAD	NAD	NAD	123
49	896122	50	F	NO	NO	NO	DM	8	42	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.3	1	NAD	NAD	NAD	109
50	902455	79	M	NO	NO	NO	DM	20	59	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.4	0.86	NAD	NAD	NAD	104
51	904808	32	F	NO	NO	NO	DM	2	30	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.6	0.92	NAD	NAD	NAD	100
52	933530	53	F	NO	NO	NO	DM	5	48	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	28.5	1.4	NAD	NAD	NAD	101
53	713491	46	M	NO	NO	NO	DM	5	41	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.8	0.94	NAD	NAD	NAD	122
54	861802	74	F	NO	NO	NO	DM	19	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.5	0.9	NAD	NAD	NAD	117
55	1151347	57	M	YES	NO	YES	DM	9	48	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	27.5	1.2	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	100
56	1187356	67	M	NO	NO	NO	DM,HTN	12	55	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	23.2	0.81	NAD	NAD	NAD	112
57	720286	61	M	NO	NO	NO	DM	10	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.8	0.9	NAD	NAD	NAD	140
58	655984	57	F	NO	NO	NO	DM	7	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.6	0.83	NAD	NAD	NAD	202
59	1178022	48	M	NO	NO	NO	DM	5	43	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	27.4	1.2	NAD	NAD	NAD	133
60	871721	54	F	NO	NO	NO	DM,HTN	6	48	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	23.2	0.87	NAD	NAD	NAD	146
61	8840101	68	M	NO	NO	NO	DM,HTN	13	55	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.6	0.92	RESTRICTED KNEE JOINT ROM	KNEE	NAD	112
62	608863	80	M	NO	NO	NO	DM,HTN	22	58	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	22.7	0.84	PRAYER SIGN POSITIVE	HAND	NAD	105
63	805674	68	F	NO	NO	NO	DM,HTN	14	54	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.2	0.94	PRAYER SIGN POSITIVE	HAND	NAD	106
64	772875	50	M	NO	NO	NO	DM	9	41	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.2	0.94	PRAYER SIGN POSITIVE	HAND	NAD	110
65	923802	67	M	NO	NO	NO	DM	6	61	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.8	0.9	RESTRICTED KNEE JOINT ROM	KNEE	NAD	125
66	803080	79	M	NO	NO	NO	DM	35	44	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.2	0.88	RESTRICTED KNEE JOINT ROM	KNEE	NAD	126
67	914087	33	F	NO	NO	NO	DM,CAD	3	30	YES	NO	NO	NO	NO	CAD	NO	NO	NO	NO	NO	25.6	0.98	NAD	NAD	NAD	111
68	944535	60	M	NO	NO	NO	DM	12	48	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.4	0.85	NAD	NAD	NAD	116
69	40587	51	F	NO	NO	NO	DM	7	53	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.2	0.85	NAD	NAD	NAD	122
70	782067	45	M	NO	NO	NO	DM	8	52	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.4	0.86	RESTRICTED KNEE JOINT ROM	KNEE	NAD	104
71	814149	56	F	NO	NO	NO	DM	2	43	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.1	0.87	NAD	NAD	NAD	102
72	306390	51	F	NO	NO	NO	DM	7	49	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22	0.86	NAD	NAD	NAD	113
73	5025	52	M	NO	NO	NO	DM	5	47	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23	0.9	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	NAD	NAD	126
74	51413	58	F	NO	NO	NO	DM	8	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.7	0.94	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	157
75	827954	45	F	NO	NO	NO	DM	4	41	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	20.6	0.82	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	188
76	1124600	55	M	NO	NO	NO	DM	1	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21	0.84	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	176
77	91623	70	M	YES	YES	YES	DM,HTN	15	55	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	20.2	0.84	RESTRICTED KNEE JOINT ROM	KNEE	NAD	177

Sr. No	MRD No	PPBS	HBA1C	X-ray Hand Shoulder Knee (wherever required)	Spine (AP view) Other involved joint	Adhesive capsulitis	Carpal tunnel syndrome	Dupuytren's contracture	Diabetic cheiroarthopathy/ limited joint mobility	Flexor tenosynovitis/ trigger finger	Diffuse Idiopathic Skeletal Hyperostosis (DISH)	Osteoarthritis	Rheumatoid Arthritis	Rheumatological manifestations
1	1025494	196	10.8	N	N	N	Y	N	N	N	N	N	N	Y
2	942025	206	8.3	N	N	N	Y	N	N	N	N	N	N	Y
3	692965	208	7.2	N	N	N	Y	N	N	N	N	N	N	Y
4	1025542	260	9.4	N	N	N	Y	N	N	N	N	N	N	Y
5	213814	172	7.6	Y	N	N	N	N	N	N	N	Y	N	Y
6	1230341	194	7.8	Y	N	N	N	N	N	N	N	Y	N	Y
7	1230344	145	7.1	Y	N	N	N	N	N	N	N	Y	N	Y
8	1006272	164	7.4	N	N	N	Y	N	N	N	N	N	N	Y
9	622233	166	8	N	N	N	Y	N	N	N	N	N	N	Y
10	894016	227	8.6	Y	N	Y	N	N	N	N	N	N	N	Y
11	894034	148	8.7	Y	N	Y	N	N	N	N	N	N	N	Y
12	893289	277	9.8	N	N	N	Y	N	N	N	N	N	N	N
13	456289	210	8.6	N	N	N	N	N	N	N	N	N	N	N
14	642634	201	8	N	N	N	N	N	Y	N	N	N	N	N
15	820419	144	6.9	N	N	N	N	N	N	N	N	N	N	N
16	1184266	142	6	N	N	N	N	N	N	N	N	N	N	N
17	680520	211	8.5	N	N	N	N	N	N	N	N	N	N	N
18	797412	310	11.8	N	N	N	Y	N	N	N	N	N	N	Y
19	648059	154	6.9	N	N	N	Y	N	N	N	N	N	N	Y
20	706283	144	6	N	N	Y	N	N	N	N	N	N	N	Y
21	1184169	167	7.1	N	N	N	N	N	N	N	N	N	N	N
22	706258	222	8.9	N	N	N	N	N	N	N	N	N	N	N
23	714237	154	6.7	N	N	N	N	N	N	N	N	N	N	N
24	723842	148	6.6	N	N	N	N	N	N	N	N	N	N	N
25	731561	166	7.1	N	N	N	N	N	N	N	N	N	N	N
26	731581	140	5.9	Y	N	N	N	N	N	N	N	Y	N	Y
27	745000	144	6.2	Y	N	N	N	N	N	N	N	Y	N	Y
28	742981	146	6.2	N	N	N	N	N	N	N	N	N	N	N
29	897089	155	6.4	Y	N	N	N	N	N	N	N	Y	N	Y
30	527728	148	6.3	N	N	N	N	N	N	N	N	N	N	N
31	1132835	166	6.8	N	N	N	N	N	N	N	N	N	N	N
32	1147235	178	7.1	N	N	N	N	N	N	N	N	N	N	N
33	116634	166	6.9	Y	N	N	N	N	N	N	N	Y	N	Y
34	380456	140	6.9	Y	N	N	N	N	N	N	N	Y	N	Y
35	1140441	142	5.8	Y	N	N	N	N	N	N	N	Y	N	Y
36	68866	167	6.7	N	N	N	N	N	N	N	N	N	N	N
37	909970	188	7.5	N	N	N	N	N	N	N	N	N	N	N
38	927987	166	6.7	N	N	N	N	N	N	N	N	N	N	N
39	926979	134	5.7	N	N	N	N	N	N	N	N	N	N	N
40	651104	132	5.8	N	N	N	N	N	N	N	N	N	N	N
41	936357	152	6.2	Y	N	N	N	N	N	N	N	Y	N	Y
42	330280	146	5.9	N	N	N	N	N	Y	N	N	N	N	Y
43	712710	158	6.4	N	Y	N	N	N	N	N	Y	N	N	N
44	951080	126	5.6	N	N	N	N	N	N	N	N	N	N	N
45	846012	126	6	N	N	N	N	N	N	N	N	N	N	N
46	768864	199	6.6	N	N	N	N	N	N	N	N	N	N	N
47	871578	153	6.4	N	N	N	N	N	N	N	N	N	N	N
48	872919	210	8.2	N	N	N	N	N	N	N	N	N	N	N
49	896122	183	7.5	N	N	N	N	N	N	N	N	N	N	N
50	902455	142	5.9	N	N	N	N	N	Y	N	N	N	N	Y
51	904808	156	6.6	N	N	N	N	N	N	N	N	N	N	N
52	933530	167	7	N	N	N	N	N	N	N	N	N	N	N
53	713491	158	6.7	N	N	N	N	N	N	N	N	N	N	N
54	861802	144	5.9	N	N	N	N	N	Y	N	N	N	N	Y
55	1151347	162	6.9	N	N	Y	N	N	N	N	N	N	N	Y
56	1187356	174	7.3	N	N	N	N	N	N	N	N	N	N	N
57	720286	198	7.4	N	N	N	N	N	N	N	N	N	N	N
58	655984	346	10.8	N	N	N	N	N	N	N	N	N	N	N
59	1178022	262	9.8	N	N	N	N	N	N	N	N	N	N	N
60	871721	299	10.7	N	N	N	N	N	Y	N	N	N	N	Y
61	8840101	146	6.4	Y	N	N	N	N	N	N	N	Y	N	Y
62	608863	140	6	N	N	N	N	N	Y	N	N	N	N	Y
63	805674	144	6.4	N	N	N	N	N	Y	N	N	N	N	Y
64	772875	155	6.6	N	N	N	N	N	Y	N	N	N	N	Y
65	923802	140	6.1	Y	N	N	N	N	N	N	N	Y	N	Y
66	803080	160	6.8	Y	N	N	N	N	N	N	N	Y	N	Y
67	914087	140	5.6	N	N	N	N	N	N	N	N	N	N	N
68	944535	167	6.7	N	N	N	N	N	N	N	N	N	N	N
69	40587	156	6.7	N	N	N	N	N	N	N	N	N	N	N
70	782067	126	5.6	N	N	N	N	N	N	N	N	N	N	N
71	814149	152	6.4	N	N	N	N	N	N	N	N	N	N	N
72	306390	144	5.9	N	N	N	N	N	N	N	N	N	N	N
73	5025	155	6.4	N	N	N	N	N	N	N	N	N	N	N
74	51413	233	9.2	N	N	N	Y	N	N	N	N	N	N	Y
75	827954	344	12	N	N	N	Y	N	N	N	N	N	N	Y
76	1124600	252	8.5	Y	N	N	Y	N	N	N	N	Y	N	Y
77	91623	313	11	Y	N	N	N	N	N	N	N	Y	N	Y

Sr. No	MRD No	Age	Sex	Joint pain	Joint swelling	Restriction of movements at the joints	Past history	Duration of diabetes	Age of onset of diabetes	Insulin	OHA	Hypertension	Stroke	Bronchial Asthma	Cardiac illness	renal disease	liver disease	Family history of diabetes	History of smoking	alcohol consumption	BMI	W/H Ratio	Joint examination	Joint involved	Other joints	FBS
78	1125812	65	M	NO	NO	NO	DM,HTN	2	63	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	23	0.87	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	112
79	1115763	60	F	YES	NO	YES	DM. KNEE REPLACEMENT	1	59	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26	1	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	145
80	604336	59	M	NO	NO	NO	DM	9	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25	0.95	NAD	NAD	NAD	109
81	846381	64	M	NO	NO	NO	DM	7	57	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.7	0.96	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	113
82	947020	62	M	NO	NO	NO	DM	6	56	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	18.9	0.84	NAD	NAD	NAD	124
83	592481	62	M	NO	NO	NO	DM,CAD	5	57	NO	YES	NO	NO	NO	CAD	NO	NO	NO	NO	NO	21	0.87	NAD	NAD	NAD	156
84	1219011	59	M	NO	NO	NO	DM	9	50	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	23	0.82	NAD	NAD	NAD	144
85	1219045	57	M	NO	NO	NO	DM	8	49	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	18.9	0.8	NAD	NAD	NAD	113
86	1217604	61	M	YES	YES	YES	DM	6	51	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25	1	RESTRICTED KNEE JOINT ROM	KNEE	NAD	122
87	728240	49	M	NO	NO	NO	DM	7	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.6	0.86	NAD	NAD	NAD	100
88	994285	60	M	NO	NO	NO	DM	8	52	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22	0.87	NAD	NAD	NAD	107
89	1220376	64	M	YES	YES	YES	DM	9	61	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.8	0.93	RESTRICTED KNEE JOINT ROM	KNEE	NAD	116
90	978005	76	M	NO	NO	NO	DM	15	49	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	19.6	0.85	NAD	NAD	NAD	118
91	1211814	71	M	NO	NO	NO	DM,HTN	16	55	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	28	0.9	NAD	NAD	NAD	146
92	1217116	56	F	NO	NO	NO	DM	6	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23	0.91	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	166
93	1185411	70	F	YES	YES	YES	DM,HYPOTHYROIDISM	16	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.6	0.89	RESTRICTED KNEE JOINT ROM	KNEE	NAD	122
94	1218236	68	F	NO	NO	NO	DM,HYPOTHYROIDISM	15	53	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.4	0.9	NAD	NAD	NAD	126
95	787621	65	F	NO	NO	NO	DM,HTN	12	53	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.8	0.98	NAD	NAD	NAD	109
96	1181018	50	M	NO	NO	NO	DM	7	43	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.7	0.82	NAD	NAD	NAD	101
97	1181810	88	M	NO	NO	NO	DM,HTN	25	63	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	28	1	NAD	NAD	NAD	134
98	1181290	53	M	NO	NO	NO	DM	5	48	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.2	0.99	NAD	NAD	NAD	122
99	1181843	65	M	NO	NO	NO	DM	15	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	29.4	0.85	PRAYER SIGN POSITIVE	HAND	NAD	121
100	1181082	61	M	NO	NO	NO	DM	6	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21	0.87	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	104
101	1181870	56	F	NO	NO	NO	DM	4	52	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.6	0.88	NAD	NAD	NAD	116
102	1181811	63	M	YES	YES	YES	DM	12	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.8	0.94	RESTRICTED KNEE JOINT ROM	KNEE	NAD	146
103	647035	54	M	NO	NO	NO	DM	6	48	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.6	0.88	NAD	NAD	NAD	133
104	1181875	67	F	NO	NO	NO	DM	8	59	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.8	0.96	NAD	NAD	NAD	115
105	1181632	55	M	NO	NO	NO	DM	6	49	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.2	0.85	NAD	NAD	NAD	102
106	1181849	66	M	NO	NO	NO	DM,CAD	6	60	NO	YES	NO	NO	NO	CAD	NO	NO	NO	NO	NO	22	0.88	NAD	NAD	NAD	166
107	1181544	61	M	NO	NO	NO	DM	7	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25	0.94	NAD	NAD	NAD	156
108	1061852	49	M	NO	NO	NO	DM	5	44	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.2	0.92	NAD	NAD	NAD	118
109	933177	51	M	NO	NO	NO	DM	6	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.6	0.89	NAD	NAD	NAD	121
110	55837	59	F	NO	NO	NO	DM	9	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.7	0.89	NAD	NAD	NAD	124
111	1188905	60	F	NO	NO	NO	DM	5	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.8	0.91	NAD	NAD	NAD	103
112	1187333	63	M	NO	NO	NO	DM	8	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22	0.87	NAD	NAD	NAD	119
113	741193	52	M	NO	NO	NO	DM,HTN	8	44	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.6	0.99	NAD	NAD	NAD	122
114	276845	54	M	YES	YES	YES	DM	5	49	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	28.8	0.84	RESTRICTED KNEE JOINT ROM	KNEE	NAD	126
115	762180	43	M	NO	NO	NO	DM	3	40	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.8	0.91	NAD	NAD	NAD	135
116	1031488	47	F	YES	NO	YES	DM	4	43	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	22	0.87	RESTRICTED KNEE JOINT ROM	KNEE	NAD	115
117	270966	67	M	YES	NO	YES	DM,HTN	10	57	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	21	0.86	RESTRICTED KNEE JOINT ROM	KNEE	NAD	167
118	1006120	41	F	NO	NO	NO	DM	7	34	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	22.7	0.82	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	142
119	1125957	54	F	NO	NO	NO	DM, HYPOTHYROIDISM	11	43	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.6	1	NAD	NAD	NAD	133
120	1016093	50	M	NO	YES	YES	DM,CAD	10	40	NO	YES	NO	NO	NO	CAD	NO	NO	NO	NO	NO	20.9	0.87	RESTRICTED KNEE JOINT ROM	KNEE	NAD	108
121	1190812	58	M	NO	NO	NO	DM,HTN	8	50	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.7	0.96	NAD	NAD	NAD	102
122	1190814	65	M	NO	NO	NO	DM,HTN	11	54	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	23	0.91	NAD	NAD	NAD	133
123	1181863	66	M	NO	NO	NO	DM,HTN	15	61	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	25.2	0.96	NAD	NAD	NAD	122
124	1191381	59	M	NO	NO	NO	DM	7	52	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.6	0.87	NAD	NAD	NAD	126
125	6130	70	F	NO	NO	NO	DM,HTN	16	54	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	28.9	0.85	RESTRICTED KNEE JOINT ROM	KNEE	NAD	178
126	1161720	54	F	NO	NO	NO	DM , HTN ,HYPOTHYROIDISM	8	46	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.5	0.98	NAD	NAD	NAD	154
127	1189650	60	F	NO	NO	NO	DM	7	53	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	19.7	0.86	NAD	NAD	NAD	111
128	1190815	65	F	YES	YES	YES	DM	10	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.6	0.97	RESTRICTED KNEE JOINT ROM	KNEE	NAD	123
129	1180338	62	M	YES	YES	YES	DM,HTN	9	53	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	25.8	1.1	RESTRICTED KNEE JOINT ROM	KNEE	NAD	105
130	1180290	70	F	NO	NO	NO	DM	8	62	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	19.6	0.84	NAD	NAD	NAD	121
131	158273	69	F	YES	YES	YES	DM,HTN	9	60	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.7	0.98	RESTRICTED KNEE JOINT ROM	KNEE	NAD	145
132	1190808	55	M	YES	YES	YES	DM	5	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.2	1.3	RESTRICTED KNEE JOINT ROM	KNEE	NAD	110
133	1190029	52	M	NO	NO	NO	DM,CAD	3	49	NO	YES	NO	NO	NO	CAD	NO	NO	NO	NO	NO	24.2	0.95	NAD	NAD	NAD	137
134	1190253	75	M	YES	YES	YES	DM,HTN	12	63	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	23	0.9	RESTRICTED KNEE JOINT ROM	KNEE	NAD	124
135	881823	45	F	YES	NO	NO	DM	10	35	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.5	0.86	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	RT UPPER LIMB	NAD	120
136	1021244	63	F	YES	NO	NO	DM	11	52	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.5	0.96	TINNEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST RT	NAD	156
137	1016080	52	F	YES	NO	NO	DM,HYPOTHYROIDISM	5	47	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23	0.9	NAD	NAD	NAD	190
138	1190700	70	M	NO	NO	NO	DM	10	60	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.8	0.91	PRAYER SIGN POSITIVE	HAND	NAD	140
139	1190818	62	F	NO	NO	NO	DM,HYPOTHYROIDISM	6	56	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	23.6	0.83	NAD	NAD	NAD	123
140	1166906	58	F	NO	NO	NO	DM	7	51	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	20.2	0.86	NAD	NAD	NAD	121
141	1190812	71	M	YES	NO	YES	DM	17	50	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	22	0.88	RESTRICTED KNEE JOINT ROM	KNEE	NAD	198
142	1190524	58	M	NO	NO	NO	DM	4	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.8	0.94	RESTRICTED KNEE JOINT ROM	KNEE	NAD	178
143	1128019	73	M	NO	NO	NO	DM,HTN	7	67	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	OCCASIONAL	25.6	0.97	KANAVEL SIGN POSITIVE	LEFT MIDDLE FINGER	NAD	123
144	1129748	43	M	YES	NO	YES	DM	1	42	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	28.8	0.96	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	190
145	345572	51	F	NO	NO	NO	DM,HTN	10	41	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.1	1.02	NAD	NO	NAD	198
146	235174	56	F	YES	NO	YES	DM	2	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.61	1	RESTRICTED KNEE JOINT ROM	KNEE	NAD	208
147	1031399	65	M	NO	NO	NO	DM,HTN	20	45	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	OCCASIONAL	23.51	1.02	NAD	SPINE	NAD	80
148	38981	49	F	NO	NO	NO	DM	2	47	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	20	0.89	NAD	NO	NAD	96
149	1028205	75	M	NO	NO	NO	DM,HTN	17	58	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	21.8	0.91	RESTRICTED KNEE JOINT ROM	KNEE	NAD	100
150	1028217	56	F	NO	NO	NO	DM,HTN	8	48	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	25.2	1.04	NAD	NO	NAD	236
151	999549	48	F	NO	NO	NO	DM	6	42	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	23.86	1.13	NAD	NAD	NAD	180
152	926409	48	M	NO	NO	NO	DM,CAD	1	47	YES	YES	NO	NO	NO	CAD	NO	NO	NO	NO	NO	25.3	1.03	NAD	NAD	NAD	169
153	1027178	78	M	NO	NO	NO	DM	20	58	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	20.04	0.97	NAD	NAD	NAD	154

Sr. No	MRD No	PPBS	HBA1C	X-ray Hand Shoulder Knee (wherever required)	Spine (AP view) Other involved joint	Adhesive capsulitis	Carpal tunnel syndrome	Dupuytren's contracture	Diabetic cheiroarthopathy/ limited joint mobility	Flexor tenosynovitis/ trigger finger	Diffuse Idiopathic Skeletal Hyperostosis (DISH)	Osteoarthritis	Rheumatoid Arthritis	Rheumatological manifestations
78	1125812	156	6.7	N	N	N	Y	N	N	N	N	N	N	Y
79	1115763	256	10.3	N	N	N	Y	N	N	N	N	N	N	Y
80	604336	156	6.4	N	N	N	N	N	N	N	N	N	N	N
81	846381	144	6.1	N	N	N	Y	N	N	N	N	N	N	Y
82	947020	176	7.2	N	N	N	N	N	N	N	N	N	N	N
83	592481	220	8.9	N	N	N	N	N	N	N	N	N	N	N
84	1219011	210	8.6	N	N	N	N	N	N	N	N	N	N	N
85	1219045	241	9.6	N	N	N	N	N	N	N	N	N	N	N
86	1217604	188	7.8	Y	N	N	N	N	N	N	N	Y	N	Y
87	728240	140	6	N	N	N	N	N	N	N	N	N	N	N
88	994285	152	7	N	N	N	N	N	N	N	N	N	N	N
89	1220376	156	6.4	Y	N	N	N	N	N	N	N	Y	N	Y
90	978005	160	6.9	N	N	N	N	N	N	N	N	N	N	N
91	1211814	267	10.7	N	N	N	N	N	N	N	N	N	N	N
92	1217116	322	11.4	Y	N	Y	N	N	N	N	N	N	N	Y
93	1185411	200	8.4	Y	N	N	N	N	N	N	N	Y	N	Y
94	1218236	214	8.7	N	N	N	N	N	N	N	N	N	N	N
95	787621	177	8	N	N	N	N	N	N	N	N	N	N	N
96	1181018	125	6	N	N	N	N	N	N	N	N	N	N	N
97	1181810	126	6.4	N	N	N	N	N	N	N	N	N	N	N
98	1181290	198	8.2	N	N	N	N	N	N	N	N	N	N	N
99	1181843	183	8.3	N	N	N	N	N	Y	N	N	N	N	Y
100	1181082	142	6.3	Y	N	Y	N	N	N	N	N	N	N	Y
101	1181870	149	6.6	N	N	N	N	N	N	N	N	N	N	N
102	1181811	194	7.9	Y	N	N	N	N	N	N	N	Y	N	Y
103	647035	177	7.5	N	N	N	N	N	N	N	N	N	N	N
104	1181875	146	6.4	N	N	N	N	N	N	N	N	N	N	N
105	1181632	157	6.8	N	N	N	N	N	N	N	N	N	N	N
106	1181849	202	7.8	N	N	N	N	N	N	N	N	N	N	N
107	1181544	333	11.6	N	N	N	N	N	N	N	N	N	N	N
108	1061852	144	6.6	N	N	N	N	N	N	N	N	N	N	N
109	933177	148	6.7	N	N	N	N	N	N	N	N	N	N	N
110	55837	162	7.7	N	N	N	N	N	N	N	N	N	N	N
111	1188905	144	6.6	N	N	N	N	N	N	N	N	N	N	N
112	1187333	168	7	N	N	N	N	N	N	N	N	N	N	N
113	741193	177	7.6	N	N	N	N	N	N	N	N	N	N	N
114	276845	183	7.6	Y	N	N	N	N	N	N	N	Y	N	Y
115	762180	176	7.3	N	N	N	N	N	N	N	N	N	N	N
116	1031488	165	8.1	Y	N	N	N	N	N	N	N	Y	N	Y
117	270966	328	11.8	Y	N	N	N	N	N	N	N	Y	N	Y
118	1006120	273	10.9	N	N	N	N	N	N	N	N	N	N	N
119	1125957	199	9	N	N	N	N	N	N	N	N	N	N	N
120	1016093	167	6.6	Y	N	N	N	N	N	N	N	Y	N	Y
121	1190812	163	7	N	N	N	N	N	N	N	N	N	N	N
122	1190814	178	7.5	N	N	N	N	N	N	N	N	N	N	N
123	1181863	201	8.4	N	N	N	N	N	N	N	N	N	N	N
124	1191381	211	8.2	N	N	N	N	N	N	N	N	N	N	N
125	6130	363	12.6	Y	N	N	N	N	N	N	N	Y	N	Y
126	1161720	269	10.6	N	N	N	N	N	N	N	N	N	N	N
127	1189650	144	6	N	N	N	N	N	N	N	N	N	N	N
128	1190815	154	6.4	Y	N	N	N	N	N	N	N	Y	N	Y
129	1180338	142	5.9	Y	N	N	N	N	N	N	N	Y	N	Y
130	1180290	163	6.8	N	N	N	N	N	N	N	N	N	N	N
131	158273	214	8.6	Y	N	N	N	N	N	N	N	Y	N	Y
132	1190808	155	6.6	Y	N	N	N	N	N	N	N	Y	N	Y
133	1190029	178	7.4	N	N	N	N	N	N	N	N	N	N	N
134	1190253	179	7.8	Y	N	N	N	N	N	N	N	Y	N	Y
135	881823	164	7	N	N	N	Y	N	N	N	N	N	N	Y
136	1021244	204	8.2	N	N	N	Y	N	N	N	N	N	N	Y
137	1016080	220	8.6	Y	N	N	N	N	N	N	N	N	N	N
138	1190700	199	8	N	N	N	N	N	Y	N	N	N	N	Y
139	1190818	187	8.1	N	N	N	N	N	N	N	N	N	N	N
140	1166906	195	7.9	N	N	N	N	N	N	N	N	N	N	N
141	1190812	389	13.5	Y	N	N	N	N	N	N	N	Y	N	Y
142	1190524	301	12.9	Y	N	N	N	N	N	N	N	Y	N	Y
143	1128019	156	7	N	N	N	N	N	N	Y	N	N	N	Y
144	1129748	274	10.1	Y	N	Y	N	N	N	N	N	N	N	Y
145	345572	362	10.6	N	N	N	N	N	N	N	N	N	N	N
146	235174	378	11.8	Y	N	N	N	N	N	N	N	Y	N	Y
147	1031399	178	8.2	N	Y	N	N	N	N	N	Y	N	N	Y
148	38981	169	7.6	N	N	N	N	N	N	N	N	N	N	N
149	1028205	129	7.3	Y	N	N	N	N	N	N	N	Y	N	Y
150	1028217	358	12	N	N	N	N	N	N	N	N	N	N	N
151	999549	370	11	N	N	N	N	N	N	N	N	N	N	N
152	926409	303	10.6	N	N	N	N	N	N	N	N	N	N	N
153	1027178	287	8.9	N	N	N	N	N	N	N	N	N	N	N

Sr. No	MRD No	Age	Sex	Joint pain	Joint swelling	Restriction of movements at the joints	Past history	Duration of diabetes	Age of onset of diabetes	Insulin	OHA	Hypertension	Stroke	Bronchial Asthma	Cardiac illness	renal disease	liver disease	Family history of diabetes	History of smoking	alcohol consumption	BMI	W/H Ratio	Joint examination	Joint involved	Other joints	FBS
154	100085	63	M	NO	NO	NO	DM	8	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.41	1.02	NAD	NAD	NAD	93
155	1026678	43	M	NO	NO	NO	DM	7	36	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	25.3	1.06	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	158
156	1007931	51	M	NO	NO	NO	DM,HTN	5	46	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	22.4	0.9	NAD	NAD	NAD	164
157	1008970	52	M	NO	NO	NO	DM	2	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.6	0.93	NAD	NAD	NAD	105
158	1008178	65	F	NO	NO	NO	DM,HTN	4	61	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	44.2	1.04	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	158
159	1120630	62	F	NO	NO	NO	DM	5	57	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.5	1.12	RESTRICTED KNEE JOINT ROM	KNEE	NAD	120
160	55113	63	F	NO	NO	NO	DM	5	58	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.6	0.92	PRAYER SIGN POSITIVE	HAND	NAD	89
161	99974	51	F	NO	NO	NO	DM,HTN	4	47	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.6	0.94	NAD	NAD	NAD	86
162	1144812	70	M	NO	NO	NO	DM	10	60	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	25.6	0.93	NAD	NAD	NAD	108
163	1210822	65	M	NO	NO	NO	DM,HTN	10	55	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	23.1	0.87	NAD	NAD	NAD	205
164	1211251	61	F	NO	NO	NO	DM,CAD	1	60	YES	YES	NO	NO	NO	CAD	NO	NO	YES	NO	NO	24.6	0.91	NAD	NAD	NAD	85
165	197988	75	M	NO	NO	NO	DM	20	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.2	0.94	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	140
166	1199092	60	F	NO	NO	NO	DM	3	57	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.3	0.9	NAD	NAD	NAD	73
167	239438	60	F	NO	NO	NO	DM,HTN	15	45	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	25.4	0.94	NAD	NAD	NAD	226
168	1195238	60	F	NO	NO	NO	DM,HTN	20	46	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	23.8	0.89	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	178
169	838177	78	M	NO	NO	NO	DM	10	68	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.2	1.1	NAD	NAD	NAD	283
170	843715	53	F	NO	NO	NO	DM	6	47	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	29.6	0.88	NAD	NAD	NAD	300
171	57391	58	F	NO	NO	NO	DM	3	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.6	0.91	NAD	NAD	NAD	265
172	168727	64	F	NO	NO	NO	DM,HTN	4	60	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	23	0.87	NAD	NAD	NAD	116
173	846167	60	M	NO	NO	NO	DM	1	59	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.5	0.89	NAD	NAD	NAD	187
174	843737	65	F	NO	NO	NO	DM	18	47	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.5	0.97	NAD	NAD	NAD	101
175	846638	75	M	NO	NO	NO	DM,HTN,HYPOTHYROIDISM	23	52	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	25.1	0.81	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	95
176	846641	64	M	NO	NO	NO	DM	20	44	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	25.7	0.95	NAD	SPINE	NAD	108
177	786431	63	M	NO	NO	NO	DM	10	53	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	23.6	0.88	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	90
178	468562	51	F	NO	NO	NO	DM	1	50	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	20.25	0.89	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	173
179	850999	72	M	NO	NO	NO	DM,HTN	10	62	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	21.6	0.86	NAD	NAD	NAD	156
180	811936	67	F	NO	NO	NO	DM	7	60	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	24.4	0.87	NAD	SPINE	NAD	274
181	569880	71	M	NO	NO	NO	DM,HTN	30	41	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	24.6	0.86	NAD	NAD	NAD	176
182	327313	63	F	NO	NO	NO	DM,HTN	10	53	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	28.7	1.04	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	68
183	852045	52	M	NO	NO	NO	DM	2	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	27.5	0.9	RESTRICTED SHOULDER JOINT ROM	SHOULDR	NAD	97
184	851880	60	M	NO	NO	NO	DM,HTN	3	57	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	22.4	0.87	NAD	SPINE	NAD	98
185	848190	60	M	NO	NO	NO	DM,HTN	9	51	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	22.5	0.9	NAD	NAD	NAD	154
186	788931	63	M	NO	NO	NO	DM	5	58	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	28.9	0.91	PRAYER SIGN POSITIVE	HAND , KNEE	NAD	70
187	876600	62	F	NO	NO	NO	DM	11	44	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	30.1	0.86	NAD	NAD	NAD	138
188	851908	75	M	NO	NO	NO	DM	15	60	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	22.8	0.91	RESTRICTED KNEE JOINT ROM	KNEE	NAD	122
189	876614	60	F	NO	NO	NO	DM,HTN	15	45	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	19.92	0.86	NAD	NAD	NAD	226
190	89090	56	M	NO	NO	NO	DM	9	47	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.2	0.91	NAD	NAD	NAD	243
191	176994	39	F	NO	NO	NO	DM,HTN	6	33	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	27.3	0.88	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	212
192	876733	72	F	NO	NO	NO	DM	10	62	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	25.1	0.96	PRAYER SIGN POSITIVE	HAND	NAD	215
193	866256	48	M	NO	NO	NO	DM	7	41	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.5	0.95	NAD	NAD	NAD	100
194	491897	43	F	NO	NO	NO	DM,HTN	3	40	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	21.6	0.9	NAD	NAD	NAD	198
195	856365	33	M	NO	NO	NO	DM	1	32	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	29.3	0.92	NAD	NAD	NAD	268
196	569880	71	M	NO	NO	NO	DM	8	63	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	20.61	0.92	NAD	NAD	NAD	271
197	1228	54	M	NO	NO	NO	DM	4	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.7	0.92	NAD	NAD	NAD	134
198	1179079	62	M	YES	NO	NO	DM,HTN	19	43	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	OCCASIONAL	25.3	0.9	NAD	SPINE	NAD	134
199	111923	78	M	YES	NO	NO	DM,HTN	25	53	YES	YES	YES	NO	NO	NO	NO	NO	NO	YES	OCCASIONAL	25.73	0.92	NAD	SPINE	NAD	126
200	1159332	65	M	YES	NO	NO	DM,HTN	24	41	YES	YES	YES	NO	NO	NO	NO	NO	YES	YES	NO	20.9	0.88	NAD	SPINE	NAD	103
201	207397	78	M	YES	NO	NO	DM,HTN	23	55	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	20.92	0.87	NAD	SPINE	NAD	344
202	1095134	65	M	YES	NO	NO	DM,HTN	5	60	YES	YES	YES	NO	NO	NO	NO	NO	YES	NO	OCCASIONAL	22.4	0.91	NAD	SPINE	NAD	102
203	1032375	58	F	YES	NO	NO	DM,HTN	1	57	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	29.5	0.89	NAD	SPINE	NAD	249
204	1014918	70	M	YES	NO	NO	DM,HTN	8	62	YES	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	21.4	0.93	NAD	SPINE	NAD	153
205	1004447	52	M	YES	NO	NO	DM,HTN	5	47	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	22.3	0.9	NAD	SPINE	NAD	177
206	961562	63	M	YES	NO	NO	DM,HTN	3	60	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	30.7	0.95	NAD	SPINE	NAD	222
207	1183048	73	M	YES	NO	NO	DM,HTN	7	66	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	OCCASIONAL	24	0.91	NAD	SPINE	NAD	154
208	980272	62	M	YES	NO	NO	DM,HTN	6	56	YES	YES	YES	NO	NO	NO	NO	NO	YES	YES	NO	26.4	0.93	NAD	SPINE	NAD	133
209	950147	43	M	YES	NO	NO	DM	1	42	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	29.4	0.91	NAD	SPINE	NAD	140
210	914278	58	M	YES	NO	NO	DM,HTN	1	57	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	25.61	0.91	NAD	SPINE	NAD	120
211	913711	60	M	YES	NO	NO	DM,HTN	6	54	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	26.5	0.95	NAD	SPINE	NAD	248
212	593751	70	M	YES	NO	NO	DM,HTN	22	48	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	OCCASIONAL	26.8	0.93	NAD	SPINE	NAD	241
213	924021	58	M	YES	NO	NO	DM,HTN	8	50	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	35.1	1.08	NAD	SPINE	NAD	153
214	751218	61	M	YES	NO	NO	DM,HTN	8	53	YES	YES	YES	NO	NO	NO	NO	NO	NO	YES	OCCASIONAL	25.61	0.96	NAD	SPINE	NAD	80
215	375855	39	F	YES	NO	NO	DM	1	38	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	20	1.04	NAD	SPINE	NAD	246
216	603290	69	M	YES	NO	NO	DM,HTN	20	49	YES	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	28	0.89	NAD	SPINE	NAD	206
217	980771	62	M	NO	NO	NO	DM	10	52	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	OCCASIONAL	21.9	0.91	NAD	WRIST	NAD	213
218	1004146	52	M	NO	NO	NO	DM	7	45	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	OCCASIONAL	20.76	0.91	NAD	WRIST	NAD	87
219	725155	54	M	NO	NO	NO	DM,HTN	6	48	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	22.61	0.8	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	143
220	912436	55	M	NO	NO	NO	DM	8	47	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	OCCASIONAL	20.2	0.95	NAD	NAD	NAD	95
221	878407	49	M	NO	NO	NO	DM,HTN	12	34	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	21.4	1.05	NAD	NAD	NAD	133
222	195950	46	F	NO	NO	NO	DM	5	41	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.8	0.96	NAD	NAD	NAD	114
223	872381	36	F	NO	NO	NO	DM	8	28	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.8	0.87	NAD	NAD	NAD	101
224	1014467	58	F	YES	NO	NO	DM	8	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.6	0.9	TINEL TEST POSITIVE , PHALEN TEST POSITIVE	WRIST	NAD	154
225	271615	65	F	NO	NO	NO	DM,HTN	10	55	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	OCCASIONAL	31	0.97	TINEL TEST POSITIVE , PHALEN TEST POSITIVE	RT UPPER LIMB	NAD	160
226	594123	56	F	NO	NO	NO	DM ,HTN	9	47	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	OCCASIONAL	24	0.94	TINEL TEST POSITIVE , PHALEN TEST POSITIVE	LEFT WRIST	NAD	136
227	880238	42	F	NO	NO	NO	DM	2	40	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	20	0.92	NAD	NAD	NAD	327
228	873247	52	F	NO	NO	NO	DM	5	52	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.61	0.96	NAD	NAD	NAD	170
229	873759	65	F	NO	NO	NO	DM,HTN	5	60	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	24.61	0.89	NAD	NAD	NAD	120
230	884714	48	F	NO	NO	NO	DM	3	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.2	0.96	NAD	NAD	NAD	137

Sr. No	MRD No	PPBS	HBA1C	X-ray Hand Shoulder Knee (wherever required)	Spine (AP view) Other involved joint	Adhesive capsulitis	Carpal tunnel syndrome	Dupuytren's contracture	Diabetic cheiroarthopathy/ limited joint mobility	Flexor tenosynovitis/ trigger finger	Diffuse Idiopathic Skeletal Hyperostosis (DISH)	Osteoarthritis	Rheumatoid Arthritis	Rheumatological manifestations
154	100085	88	5.8	N	N	N	N	N	N	N	N	N	N	N
155	1026678	271	9	Y	N	Y	N	N	N	N	N	N	N	Y
156	1007931	379	14	N	N	N	N	N	N	N	N	N	N	N
157	1008970	254	8.8	N	N	N	N	N	N	N	N	N	N	N
158	1008178	277	8.7	Y	N	Y	N	N	N	N	N	Y	N	Y
159	1120630	163	7.5	Y	N	N	N	N	N	N	N	Y	N	Y
160	55113	128	6.2	N	N	N	N	N	Y	N	N	N	N	Y
161	99974	123	6.8	N	N	N	N	N	N	N	N	N	N	N
162	1144812	228	9	N	N	N	N	N	N	N	N	N	N	N
163	1210822	243	9.3	N	N	N	N	N	N	N	N	N	N	N
164	1211251	115	6	N	N	N	N	N	N	N	N	N	N	N
165	197988	196	8	Y	N	Y	N	N	N	N	N	N	N	Y
166	1199092	180	7.4	N	N	Y	N	N	N	N	N	N	N	Y
167	239438	201	8.7	N	N	N	N	N	N	N	N	N	N	N
168	1195238	199	9.1	Y	N	Y	N	N	N	N	N	N	N	Y
169	838177	443	12.9	N	N	N	N	N	N	N	N	N	N	N
170	843715	359	13.8	N	N	Y	N	N	N	N	N	N	N	Y
171	57391	344	14	N	N	N	N	N	N	N	N	N	N	N
172	168727	235	9.6	N	N	N	N	N	N	N	N	N	N	N
173	846167	268	10.6	N	N	N	N	N	N	N	N	N	N	N
174	843737	124	5.8	N	N	N	N	N	N	N	N	N	N	N
175	846638	188	9.6	N	N	Y	N	N	N	N	N	N	N	Y
176	846641	149	7.7	N	N	N	N	N	N	N	N	N	N	N
177	786431	148	7.1	Y	N	Y	N	N	N	N	N	N	N	Y
178	468562	218	7.3	Y	N	Y	N	N	N	N	N	N	N	Y
179	850999	334	11.5	N	N	N	N	N	N	N	N	N	N	N
180	811936	245	10	N	Y	N	N	N	N	N	Y	N	N	Y
181	569880	392	11.4	N	N	N	N	N	N	N	N	N	N	N
182	327313	130	5.9	Y	N	Y	N	N	N	N	N	N	N	Y
183	852045	142	6.2	Y	N	Y	N	N	N	N	N	Y	N	Y
184	851880	130	5.8	N	Y	N	N	N	N	N	Y	N	N	Y
185	848190	243	9.8	N	N	N	Y	N	N	N	N	N	N	Y
186	788931	193	6	Y	N	N	N	N	Y	N	N	Y	N	Y
187	876600	180	7.1	N	N	N	N	N	N	N	N	N	N	N
188	851908	174	6.8	Y	N	N	N	N	N	N	N	Y	N	Y
189	876614	302	11.3	N	N	N	N	N	N	N	N	N	N	N
190	89090	258	10.8	N	N	N	N	N	Y	N	N	N	N	Y
191	176994	304	11	Y	N	Y	N	N	N	N	N	N	N	Y
192	876733	257	10.2	N	N	N	N	N	Y	N	N	N	N	Y
193	866256	272	9	N	N	N	N	N	N	N	N	N	N	N
194	491897	252	10	N	N	N	N	N	N	N	N	N	N	N
195	856365	309	10.6	N	N	N	N	N	N	N	N	N	N	N
196	569880	419	13	N	N	N	N	N	N	N	N	N	N	N
197	1228	160	7.5	N	N	N	N	N	N	N	N	N	N	N
198	1179079	195	9.6	N	Y	N	N	N	N	N	Y	N	N	Y
199	111923	160	7.8	N	Y	N	N	N	N	N	Y	N	N	Y
200	1159332	164	8.2	N	Y	N	N	N	N	N	Y	N	N	Y
201	207397	453	12.9	N	Y	N	N	N	N	N	Y	N	N	Y
202	1095134	186	8.6	N	Y	N	N	N	N	N	Y	N	N	Y
203	1032375	411	8.1	N	Y	Y	N	N	N	N	Y	N	N	Y
204	1014918	192	7.4	N	Y	N	N	N	N	N	Y	N	N	Y
205	1004447	387	10.4	N	Y	N	N	N	N	N	Y	N	N	Y
206	961562	305	10.7	N	N	N	N	N	N	N	N	N	N	N
207	1183048	221	9.5	N	Y	N	N	N	N	N	Y	N	N	Y
208	980272	208	9.5	N	Y	N	N	N	N	N	Y	N	N	Y
209	950147	188	8.2	Y	Y	N	N	N	N	N	Y	Y	N	Y
210	914278	142	6.4	N	Y	N	N	N	N	N	Y	N	N	Y
211	913711	208	10.6	Y	Y	N	N	N	N	N	Y	Y	N	Y
212	593751	244	10.4	N	Y	N	N	N	N	N	Y	N	N	Y
213	924021	206	8	N	Y	N	N	N	N	N	Y	N	N	Y
214	751218	220	8.3	N	Y	N	N	N	N	N	Y	N	N	Y
215	375855	326	11.3	N	Y	N	N	N	N	N	Y	N	N	Y
216	603290	272	10.1	Y	Y	N	N	N	N	N	Y	Y	N	Y
217	980771	250	9.8	N	N	N	Y	N	N	N	N	N	N	Y
218	1004146	169	6.5	N	N	N	Y	N	N	N	N	N	N	Y
219	725155	180	9.4	N	N	Y	N	N	N	N	N	N	N	Y
220	912436	208	8.3	N	N	N	N	N	N	N	N	N	N	N
221	878407	173	9.2	N	N	N	N	N	N	N	N	N	N	N
222	195950	134	5.6	N	N	N	N	N	N	N	N	N	N	N
223	872381	152	6.7	N	N	N	Y	N	N	N	N	N	N	N
224	1014467	184	7.8	N	N	N	Y	N	N	N	N	N	N	Y
225	271615	174	7.4	N	N	N	Y	N	N	N	N	N	N	Y
226	594123	184	8	N	N	N	Y	N	N	N	N	N	N	Y
227	880238	404	13	N	N	N	N	N	N	N	N	N	N	N
228	873247	159	6.9	N	N	N	N	N	N	N	N	N	N	N
229	873759	177	7.3	N	N	N	N	N	N	N	N	N	N	N
230	884714	135	5.4	N	N	N	N	N	N	N	N	N	N	N

Sr. No	MRD No	Age	Sex	Joint pain	Joint swelling	Restriction of movements at the joints	Past history	Duration of diabetes	Age of onset of diabetes	Insulin	OHA	Hypertension	Stroke	Bronchial Asthma	Cardiac illness	renal disease	liver disease	Family history of diabetes	History of smoking	alcohol consumption	BMI	W/H Ratio	Joint examination	Joint involved	Other joints	FBS
231	880769	74	M	YES	YES	YES	DM,HTN	9	65	YES	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	21.3	0.93	RESTRICTED KNEE JOINT ROM	KNEE	NAD	150
232	740988	74	M	NO	NO	NO	DM,HTN,HYPOTHYROIDISM	13	61	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	20.9	0.93	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	198
233	876023	52	F	NO	NO	NO	DM	6	46	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	23.1	0.96	NAD	NAD	NAD	266
234	876000	70	M	NO	NO	NO	DM	15	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	OCCASIONAL	20.5	0.94	NAD	NAD	NAD	294
235	879456	62	M	NO	NO	NO	DM	3	59	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.6	1.09	NAD	NAD	NAD	89
236	649173	54	F	NO	NO	NO	DM	5	49	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	20.5	1.01	NAD	NAD	NAD	97
237	592313	68	M	NO	NO	NO	DM	13	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.2	0.95	PRAYER SIGN POSITIVE	HAND	NAD	112
238	651414	52	F	NO	NO	NO	DM	6	46	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.7	0.87	RESTRICTED KNEE JOINT ROM	KNEE	NAD	120
239	89010	56	M	NO	NO	NO	DM	5	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.8	0.93	RESTRICTED KNEE JOINT ROM	KNEE	NAD	118
240	171563	63	M	NO	NO	NO	DM,HTN	7	56	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	27.3	0.94	RESTRICTED KNEE JOINT ROM	KNEE	NAD	106
241	1171414	55	F	NO	NO	NO	DM	5	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.6	0.94	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	110
242	1154337	52	F	NO	NO	NO	DM	2	50	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.2	0.92	RESTRICTED KNEE JOINT ROM	KNEE	NAD	114
243	1153161	67	F	NO	NO	NO	DM,HTN	12	55	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	21.1	0.94	RESTRICTED KNEE JOINT ROM	KNEE	NAD	122
244	1139746	76	F	NO	NO	NO	DM,HTN	20	56	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	26.1	0.96	RESTRICTED KNEE JOINT ROM	KNEE	NAD	110
245	1128257	48	F	NO	NO	NO	DM	6	42	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	27.9	0.88	PRAYER SIGN POSITIVE	HAND	NAD	126
246	5175	46	F	NO	NO	NO	DM	4	42	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.3	0.85	NAD	NAD	NAD	120
247	647549	54	F	NO	NO	NO	DM	6	48	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	29.2	0.9	RESTRICTED KNEE JOINT ROM	KNEE	NAD	113
248	1005462	85	M	NO	NO	NO	DM	22	63	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	22.6	0.91	RESTRICTED KNEE JOINT ROM	KNEE	NAD	120
249	146304	66	F	NO	NO	NO	DM,HTN	10	56	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	25	0.87	RESTRICTED KNEE JOINT ROM	KNEE	NAD	119
250	1084188	62	M	NO	NO	NO	DM	7	55	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	29.2	0.95	RESTRICTED KNEE JOINT ROM	KNEE	NAD	126
251	1070453	67	F	NO	NO	NO	DM,HTN	8	59	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	26.1	0.9	RESTRICTED KNEE JOINT ROM	KNEE	NAD	110
252	748253	55	M	NO	NO	NO	DM	7	48	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	21.91	0.96	RESTRICTED KNEE JOINT ROM	KNEE	NAD	126
253	972667	55	M	NO	NO	NO	DM	4	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.4	0.92	RESTRICTED KNEE JOINT ROM	KNEE	NAD	114
254	507751	54	M	NO	NO	NO	DM	3	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.11	0.94	RESTRICTED KNEE JOINT ROM	KNEE	NAD	106
255	438570	50	M	NO	NO	NO	DM	6	44	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	19.3	0.87	NAD	NAD	NAD	112
256	747884	49	M	NO	NO	NO	DM	3	46	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.4	0.97	NAD	NAD	NAD	106
257	748750	40	M	NO	NO	NO	DM	1	39	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	21.8	0.98	NAD	NAD	NAD	126
258	717114	70	F	NO	NO	NO	DM,HTN	14	56	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	21.2	0.94	RESTRICTED KNEE JOINT ROM	KNEE	NAD	108
259	749781	65	M	NO	NO	NO	DM,HTN	8	57	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	27.5	0.87	PRAYER SIGN POSITIVE	HAND	NAD	113
260	633961	48	M	NO	NO	NO	DM	3	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.7	1.02	NAD	NAD	NAD	122
261	397112	71	F	NO	NO	NO	DM,HTN	13	58	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	26.8	0.94	PRAYER SIGN POSITIVE	HAND	NAD	114
262	751410	63	M	NO	NO	NO	DM	3	60	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.3	0.94	RESTRICTED KNEE JOINT ROM	KNEE	NAD	108
263	323123	46	M	NO	NO	NO	DM	4	42	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.3	0.94	NAD	NAD	NAD	110
264	752410	52	M	NO	NO	NO	DM	9	43	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	28.2	0.92	NAD	NAD	NAD	106
265	722134	65	M	NO	NO	NO	DM	10	55	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	27.7	0.9	NAD	NAD	NAD	122
266	722175	66	F	NO	NO	NO	DM	6	60	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	20.3	0.85	NAD	NAD	NAD	124
267	502116	61	F	NO	NO	NO	DM	10	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	27.5	0.82	NAD	NAD	NAD	107
268	723118	76	M	NO	NO	NO	DM	15	61	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	24.1	0.95	NAD	NAD	NAD	118
269	723672	65	M	NO	NO	NO	DM	12	53	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	26.7	0.93	NAD	NAD	NAD	110
270	714237	60	F	NO	NO	NO	DM	8	52	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	19.6	0.94	NAD	NAD	NAD	116
271	346672	57	F	NO	NO	NO	DM	6	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.3	0.95	NAD	NAD	NAD	108
272	39319	71	M	NO	NO	NO	DM,HTN	22	49	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	20.4	1.06	RESTRICTED SHOULDER JOINT ROM	SHOULDER	NAD	118
273	882726	60	M	NO	NO	NO	DM	7	53	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.3	0.92	NAD	NAD	NAD	100
274	824379	63	F	NO	NO	NO	DM	7	56	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	24.2	0.87	NAD	NAD	NAD	126
275	878652	48	F	NO	NO	NO	DM	5	43	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.6	0.91	NAD	NAD	NAD	105
276	881872	49	M	NO	NO	NO	DM	4	45	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.3	0.95	NAD	NAD	NAD	110
277	885024	62	M	NO	NO	NO	DM,HTN	8	54	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	22.8	0.9	NAD	NAD	NAD	102
278	885566	62	F	NO	NO	NO	DM	10	52	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.6	0.96	NAD	NAD	NAD	113
279	885842	70	F	NO	NO	NO	DM,HTN	17	53	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	22	0.91	NAD	NAD	NAD	124
280	905048	65	F	NO	NO	NO	DM,HTN	11	54	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	23.5	0.92	NAD	NAD	NAD	146
281	906889	60	M	NO	NO	NO	DM,HTN	8	52	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	22	0.87	KANAVEL SIGN POSITIVE	RT INDEX FINGER	NAD	132
282	3697	45	M	YES	YES	YES	DM	6	39	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	OCCASIONAL	25	0.9	KANAVEL SIGN POSITIVE	RT MIDDLE FINGER	NAD	160
283	889571	50	F	YES	YES	YES	DM	7	43	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	24.2	0.89	KANAVEL SIGN POSITIVE	LEFT MIDDLE FINGER	NAD	148
284	858334	70	M	NO	NO	NO	DM,HTN	20	50	YES	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	23.5	0.87	KANAVEL SIGN POSITIVE	LEFT MIDDLE FINGER	NAD	131
285	973904	50	F	NO	NO	NO	DM	8	42	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	25.2	0.92	KANAVEL SIGN POSITIVE	RT INDEX FINDER	NAD	140
286	970804	32	F	NO	NO	NO	DM	4	42	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	24.2	0.87	KANAVEL SIGN POSITIVE	RT INDEX FINGER	NAD	150
287	977189	38	F	NO	NO	NO	DM	7	44	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	22	0.85	NAD	SPINE	NAD	131
288	172626	54	M	NO	NO	NO	DM	9	45	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	23	0.86	KANAVEL SIGN POSITIVE	LFFT INDEX FINGER	NAD	138
289	905048	65	F	NO	NO	NO	DM	13	52	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	30	0.87	NAD	NAD	NAD	154
290	408064	71	M	NO	NO	NO	DM,HTN	13	58	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	27	0.9	RESTRICTED KNEE JOINT ROM	KNEE	NAD	166
291	1125957	54	M	NO	NO	NO	DM,HTN,HYPOTHYROIDISM	11	43	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	25.6	0.94	RESTRICTED KNEE JOINT ROM	KNEE	NAD	151
292	901055	64	M	YES	NO	NO	DM,HTN	10	54	YES	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	23.8	0.89	RESTRICTED ROM	RT SHOULDER	NAD	100
293	901177	58	M	NO	NO	NO	DM	7	51	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	25.6	0.96	RESTRICTED AND PAINFUL ROM	RT SHOULDER	NAD	145
294	1121173	75	F	YES	YES	NO	DM,HTN	18	57	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	24	0.94	TINEL TEST POSITIVE ,PHALEN TEST POSITIVE	WRIST	NAD	166
295	1121249	60	F	NO	NO	NO	DM	6	54	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.5	0.93	TINEL TEST POSITIVE ,PHALEN TEST POSITIVE	WRIST	NAD	146
296	1020018	52	F	NO	NO	NO	DM	5	47	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23	0.9	TINEL TEST POSITIVE ,PHALEN TEST POSITIVE	WRIST	NAD	130
297	846059	59	F	YES	NO	NO	DM,HTN	9	50	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	25	0.95	TINEL TEST POSITIVE ,PHALEN TEST POSITIVE	WRIST	NAD	176
298	1016690	62	F	YES	NO	NO	DM,HTN	10	52	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	24	0.88	TINEL TEST POSITIVE ,PHALEN TEST POSITIVE	WRIST	NAD	188
299	3998	48	F	YES	NO	NO	DM	7	41	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	23.2	0.87	TINEL TEST POSITIVE ,PHALEY TEST POSITIVE	WRIST	NAD	176
300	1016093	46	M	NO	NO	NO	DM	5	41	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO		24	0.9	TINEL TEST POSITIVE ,PHALEY TEST POSITIVE	WRIST	NAD	136

Sr. No	MRD No	PPBS	HBA1C	X-ray Hand Shoulder Knee (wherever required)	Spine (AP view) Other involved joint	Adhesive capsulitis	Carpal tunnel syndrome	Dupuytren's contracture	Diabetic cheiroarthopathy/ limited joint mobility	Flexor tenosynovitis/ trigger finger	Diffuse Idiopathic Skeletal Hyperostosis (DISH)	Osteoarthritis	Rheumatoid Arthritis	Rheumatological manifestations
231	880769	357	12.3	Y	N	N	N	N	N	N	N	Y	N	Y
232	740988	238	10.2	N	N	N	N	N	N	N	N	N	N	N
233	876023	215	11	N	N	N	N	N	N	N	N	N	N	N
234	876000	484	16.2	N	N	N	N	N	N	N	N	N	N	N
235	879456	104	5.9	N	N	N	N	N	N	N	N	N	N	N
236	649173	122	6.2	N	N	N	N	N	N	N	N	N	N	N
237	592313	146	6.64	Y	N	N	N	N	Y	N	N	Y	N	Y
238	651414	156	5.84	Y	N	N	N	N	N	N	N	Y	N	Y
239	89010	140	7	Y	N	N	N	N	N	N	N	Y	N	Y
240	171563	140	7.7	Y	N	N	N	N	N	N	N	Y	N	Y
241	1171414	155	6.4	Y	N	Y	N	N	N	N	N	N	N	Y
242	1154337	166	5.6	Y	N	N	N	N	N	N	N	Y	N	Y
243	1153161	140	6.7	Y	N	N	N	N	N	N	N	Y	N	Y
244	1139746	130	6.6	Y	N	N	N	N	Y	N	N	Y	N	Y
245	1128257	140	7.4	N	N	N	N	N	N	N	N	N	N	N
246	5175	166	7	N	N	N	N	N	N	N	N	N	N	N
247	647549	178	8.4	Y	N	N	N	N	N	N	N	Y	N	Y
248	1005462	194	9.2	Y	N	N	N	N	N	N	N	Y	N	Y
249	146304	156	6.6	Y	N	N	N	N	N	N	N	Y	N	Y
250	1084188	138	6	Y	N	N	N	N	N	N	N	Y	N	Y
251	1070453	166	6.2	Y	N	N	Y	N	N	N	N	Y	N	Y
252	748253	156	7.3	Y	N	N	N	N	N	N	N	Y	N	Y
253	972667	186	6.8	Y	N	N	N	N	N	N	N	Y	N	Y
254	507751	146	6.6	Y	N	N	N	N	N	N	N	Y	N	Y
255	438570	178	6.4	N	N	N	N	N	N	N	N	N	N	N
256	747884	154	6.1	N	N	N	N	N	N	N	N	N	N	N
257	748750	113	7.8	N	N	N	N	N	N	N	N	N	N	N
258	717114	148	7.1	Y	N	N	N	N	N	N	N	Y	N	Y
259	749781	154	6.4	N	N	N	N	N	Y	N	N	N	N	Y
260	633961	180	6.72	N	N	N	N	N	N	N	N	N	N	N
261	397112	140	5.84	N	N	N	N	N	Y	N	N	N	N	Y
262	751410	164	6.08	Y	N	N	N	N	N	N	N	Y	N	Y
263	323123	158	6.68	N	N	N	N	N	N	N	N	N	N	N
264	752410	149	5.9	N	N	N	N	N	N	N	N	N	N	N
265	722134	192	7.52	N	N	N	N	N	N	N	N	N	N	N
266	722175	178	6.6	N	N	N	N	N	N	N	N	N	N	N
267	502116	156	5.9	N	N	N	N	N	N	N	N	N	N	N
268	723118	168	7.2	N	N	N	N	N	N	N	N	N	N	N
269	723672	144	6.5	N	N	N	N	N	N	N	N	N	N	N
270	714237	152	6.6	N	N	N	N	N	N	N	N	N	N	N
271	346672	164	7.94	N	N	N	N	N	N	N	N	N	N	N
272	39319	142	5.84	Y	N	Y	N	N	N	N	N	N	N	Y
273	882726	188	7.4	N	N	N	N	N	N	N	N	N	N	N
274	824379	162	6.7	N	N	N	N	N	N	N	N	N	N	N
275	878652	146	5.7	N	N	N	N	N	N	N	N	N	N	N
276	881872	177	7.04	N	N	N	N	N	N	N	N	N	N	N
277	885024	166	7.6	N	N	N	N	N	N	N	N	N	N	N
278	885566	160	6.8	N	N	N	N	N	N	N	N	N	N	N
279	885842	199	7.4	N	N	N	N	N	N	N	N	N	N	N
280	905048	184	8	N	N	N	N	Y	N	N	N	N	N	Y
281	906889	208	8.4	N	N	N	N	N	N	Y	N	N	N	Y
282	3697	232	9	N	N	N	N	N	N	Y	N	N	N	Y
283	889571	220	8.3	N	N	N	N	N	N	Y	N	N	N	Y
284	858334	210	8	N	N	N	N	N	N	Y	N	N	N	Y
285	973904	196	7.9	N	N	N	N	N	N	N	N	N	N	N
286	970804	226	8.5	N	N	N	N	N	N	Y	N	N	N	Y
287	977189	189	7.4	N	N	N	N	Y	N	N	N	N	N	Y
288	172626	176	6.9	Y	N	N	N	N	N	Y	N	N	N	Y
289	905048	210	8.5	N	N	N	N	N	N	N	N	N	N	N
290	408064	232	9.4	Y	N	N	N	N	N	N	N	Y	N	Y
291	1125957	198	8.2	Y	N	N	N	N	N	N	N	Y	N	Y
292	901055	174	6.8	Y	N	Y	N	N	N	N	N	N	N	Y
293	901177	202	9	Y	N	Y	N	N	N	N	N	N	N	Y
294	1121173	200	8.5	N	N	N	Y	N	N	N	N	N	N	Y
295	1121249	188	7.5	N	N	N	Y	N	N	N	N	N	N	Y
296	1020018	176	8	N	N	N	Y	N	N	N	N	N	N	Y
297	846059	210	8.6	N	N	N	Y	N	N	N	N	N	N	Y
298	1016690	246	9.4	N	N	N	Y	N	N	N	N	N	N	Y
299	3998	200	8.2	N	N	N	Y	N	N	N	N	N	N	Y
300	1016093	178	7.8	N	N	N	Y	N	N	N	N	N	N	Y

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Date 20/1/2021

The Principal,
DMC,Ludhiana

Subject: **Approval of Plan of Thesis.**

This is to inform you that the Faculty of Medical Sciences in its meeting held on 22.01.2021 has approved the plan of thesis of **Dr. Kushdeep Singh,** a student of your college for **MD General Medicine** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis
Study of rheumatological manifestations among patients with diabetes mellitus

Supervisor
Dr. Narender Pal Jain
Prof.,
Dept. of Medicine,
DMCH, Ludhiana.

Co-Supervisor
Dr. Parminder Singh
Prof. & Head,
Dept. of Endocrinology,
DMCH, Ludhiana.
Dr. Sandeep Chhabra
Assoc. Prof.,
Dept. of Medicine,
DMCH, Ludhiana.

The student has to submit the three copies of thesis (along with PDF format) , to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She must directed to attach a photocopy of this letter with the forwarding letter while submitting thesis to the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic,(if any).

S P Singh

Dr. S P Singh MS(Oph)
Controller of Examinations

Note :

1. ***If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.***
2. *The student may submit the thesis as per the schedule already conveyed i.e for May/June examination 30th Nov of the preceding the year of examination and for Nov/Dec examinations 31st May of the year of examination.*

STUDY OF RHEUMATOLOGICAL MANIFESTATIONS AMONG PATIENTS WITH DIABETES MELLITUS

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF MEDICINE

In

MEDICINE

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES
FARIDKOT

OCTOBER, 2019 DR. KUSHDEEP SINGH

DEPARTMENT OF MEDICINE
DAYANAND MEDICAL COLLEGE AND HOSPITAL
LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	STUDY OF RHEUMATOLOGICAL MANIFESTATIONS AMONG PATIENTS WITH DIABETES MELLITUS
For the degree of	M.D Medicine
Name of the candidate	Dr Kushdeep Singh
Supervisor	Dr Narender Pal Jain, Professor, Department of Medicine, DMCH, Ludhiana
Co-supervisor	Dr Parminder Singh, Professor& Head, Department of Endocrinology, DMCH, Ludhiana Dr. Sandeep Chhabra, Associate Professor, Department of Medicine, DMCH, Ludhiana
Institution	Dayanand Medical College & Hospital, Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction: Diabetes mellitus is a chronic metabolic condition characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action or both. It is associated with long term damage, dysfunction and failure of various organs. Although the other complications of diabetes mellitus are recognized as the major causes of morbidity and mortality, the rheumatological manifestations associated with it may be very debilitating. So, it is important to recognize the various joint and bone manifestations of diabetes.

Aim of Study: To study the clinical profile of rheumatological manifestations in diabetic patients.

Materials & Methods: An observation study conducted among 300 randomly selected consenting subjects, diagnosed with diabetes mellitus using a blood glucose fasting ≥ 126 mg/dl and a 2-hour post prandial plasma blood sugar ≥ 200mg/dl, visiting Endocrinology and Medicine OPD at DMC & H, LUDHIANA.

Clinical Significance: In clinical practice patients can be screened for rheumatological complications and we can study the prevalence and types of rheumatological manifestations in patients with diabetes.

Keywords:T2DM, Diabetic Cheiroarthropathy, DISH (Diffuse Idiopathic Skeletal Hyperostosis).

(Signature)	(Signature)	(Signature)	(Signature)	(Signature)
Candidate	Co-supervisor	Co-supervisor	Supervisor	Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis titled **"STUDY OF RHEUMATOLOGICAL MANIFESTATIONS AMONG PATIENTS WITH DIABETES MELLITUS"** exist in the Department of Medicine, DMC&H, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis is genuine and is collected by the candidate himself under our supervision and guidance.

Supervisor

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Co-Supervisor

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Head of the Department

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Professor & Head
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Place : _____

Date : _____

APPROVAL PROFORMA
BY RESEARCH & ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

Name of candidate	Dr. Kushdeep Singh
Department	Medicine
Topic of Thesis	STUDY OF RHEUMATOLOGICAL MANIFESTATIONS AMONG PATIENTS WITH DIABETES MELLITUS
Likely date of appearing in PG examination	May 2022
Date of enrollment	7th May, 2019
Name of Head of Department	Dr. Dinesh Gupta
1) Supervisor **2) Co-Supervisor**	Dr. Narender Pal Jain Dr. Parminder Singh Dr. Sandeep Chhabra
Signature of Members of Research Committee with Stamp	**Signature of Members of Ethics Committee with Stamp**
Dr. Jaspal Singh (Professor & Head, Surgery)	Mr. A K Jindal (Member, Ethics Committee)
Dr. Dinesh Gupta (Professor & Head, Medicine)	Dr. Anu Sharma (Professor, Anatomy)
Dr. Sandeep Kaushal (Assistant Dean Academics)	Dr. Deepinder K Chhina (Professor & Head, Microbiology)
Dr. Rajoo Singh Chhina (Dean Academics)	Dr. Neena Sood (Professor & Head, Pathology)
Dr. Gurpreet S Wander (Vice Principal)	Dr. Gurpreet S Wander (Vice Principal)
	Dr. Gagandeep Singh (Secretary, Ethics Committee Professor & Head, Neurology)

Approved: Yes / ~~No~~

Dr. Sandeep Puri
Chairperson
Research Committee

Chairperson
Research Committee

Approved: Yes / No

Prof. Arvind Malhotra
Chairperson
Ethics Committee

Chairperson
Ethics Committee

BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT

PROFORMA FOR REGISTRATION OF SUBJECT FOR DISSERTATION

1	NAME OF THE CANDIDATE AND ADDRESS	KUSHDEEP SINGH HOUSE NUMBER-29, MAHARAJA CITY ROPAR
2	NAME OF THE INSTITUTE	DAYANAND MEDICAL COLLEGE AND HOSPITAL, LUDHIANA
3	COURSE OF STUDY AND SUBJECT	MD Medicine
4	DATE OF ADMISSION OF COURSE	07-05-2019
5	TITLE OF THE TOPIC	STUDY OF RHEUMATOLOGICAL MANIFESTATIONS AMONG PATIENTS WITH DIABETES MELLITUS

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Diabetes Mellitus is fast emerging as a global epidemic. It presents with a myriad of acute and chronic complications of which macrovascular and microvascular complications dominate the physician's and patient's attention. The rheumatological complications are very common but often ignored and highly under recognized. They can be very incapacitating and contribute to significant physical disability and impair quality of life. The exact pathophysiology of these complications is not known, however, connective tissue disorders, neuropathy or vasculopathy may have a synergistic effect. It is postulated that prolonged hyperglycemia results in collagen glycosylation. This glycosylated collagen is less soluble, offers increased resistance to collagenases and accumulates in connective tissue, which not only alters extracellular matrix structure and functions but also impairs cell viability thus resulting in various manifestations.[1] The conventional risk factors of urbanization, unhealthy dietary practices as well as physical inactivity, coupled with inherent genetic attributes and differences in body composition are propelling the increase in prevalence of diabetes. Accordingly, diabetes related complications are also on the rise and contribute significantly to the overall morbidity and mortality. The major complications of diabetes are classified as micro-vascular and macro-vascular. But the long-term and often infrequently addressed complications like those involving the musculo-skeletal system can be more debilitating by causing limitation of movement, thereby creating a vicious cycle of poor glycemic control and reduced quality of life.[2] Although the precise etiology of diabetes associated rheumatological disorders remains elusive, evidence indicate, hyperglycemia may accelerate nonenzymatic glycosylation and abnormal collagen deposition in periarticular connective tissues, which in turn alter the structural matrix and mechanical properties of the musculo-skeletal tissues leading to diffuse arthrofibrosis and stiffness.[3] Although researchers have occasionally dealt with the prevalence and types of various rheumatological manifestations, studies exploring the factors associated with the coexistence of rheumatological manifestations and diabetes mellitus are scarce. Studies from India are fewer. The present study

is undertaken to find out the distribution of different rheumatological problems in Indian diabetic population and the factors associated with this occurrence.

6.2 REVIEW OF LITERATURE

Diabetes mellitus is a multi-system disease characterized by persistent hyperglycemia that has both acute and chronic biochemical and anatomical sequelae.[4] The World Health Organization has projected that the global prevalence of diabetes mellitus accounting for 85-95% of all cases will increase from 125 million in 1995 to 300 million by the year 2025.[5]

The metabolic disturbances of diabetes mellitus cause chronic irreversible damage to vital organs and systems. Though the cardiovascular, renal and ocular complications of diabetes are the most severe, there are various rheumatological manifestations which occur more frequently in patients with diabetes mellitus than in the general population. In contrast to various vascular complications of diabetes mellitus which are life threatening, rheumatological manifestations lead to considerable morbidity.[6]

The rheumatological manifestations associated with diabetes mellitus can be classified under four categories[7]:

Consequence of diabetic complications

Diabetic muscular infarction

Neuropathic arthropathy

Consequences of metabolic derangements inherent to diabetes

Diffuse idiopathic skeletal hyperostosis

Osteopenia

Syndromes that may share etiogenic mechanisms with microvascular disease.

Adhesive capsulitis of shoulder

Dupuytren's disease

Limited joint mobility syndrome (cheiroarthropathy)

Palmar flexor tenosynovitis

- **Probable association with diabetes**

Carpal tunnel syndrome

Gout

Osteoarthritis

Diabetes mellitus affects connective tissues in many ways and cause different alterations in periarticular and skeletal system.[8]

A study done by Cagliero E[9] showed prevalence of rheumatological manifestations was greater in diabetic patients (36%) than in patients in the control group (9%) and more common in patients with type 1 diabetes than in those with type 2 diabetes mellitus.

Most of the musculoskeletal manifestations seem to be associated with the duration of diabetes mellitus and appear in diabetic patients of younger age, than their counter parts in general population.[10]

Adhesive Capsulitis of Shoulder

Typically presents as complete progressive painful limitation on active and passive mobility specially abduction and external rotation. It's prevalence in diabetic varies from 10-29%. Increase prevalence of shoulder calcification has been noticed with long duration of disease and treatment with insulin.[11] Bridgman[12] identified adhesive capsulitis in 11% of 800 diabetic patients as compared with 2.5% in 600 control patients. In 4.5% of the patients with adhesive capsulitis, both shoulders were involved. In the study done by Mavrikakis[13] it was found that 31.8% of diabetics had shoulder calcification compared with 10.3% of the control group. The calcific shoulder periarthritis was located in the right shoulder in 44.7%, in the left shoulder in 26.7 % and bilaterally in 28.6% of the patients with diabetes.

Study done by Pal[14] showed shoulder capsulitis was present in 19% of patients with diabetes mellitus and 5% of normal subjects. Adhesive capsulitis was seen in 20.4% of patients with type I diabetes and in 18.3% of patients with type 2 diabetes. In a study by Mavrikakis[13], of 824 type 2 diabetics & 320 control subjects shoulder capsulitis was observed in 31.8% and 10.3% of subjects respectively. Study done by Sarkar[3] showed that frozen shoulder was present in 17.9% of 860 diabetics and 7% of 800 non diabetics. Study done by Enrico Cagliero[9] showed adhesive capsulitis was present in 12% of the diabetic patients and none of the control patients. Diabetic shoulder capsulitis appears at a younger age, is less painful, respond less well to treatment and usually lasts longer than non-diabetic shoulder capsulitis.[15]

High frequency of other hand syndromes such as limited joint mobility or cheiroarthropathy has been found among diabetic patients with shoulder capsulitis.[16] Study done by Balci N[17] showed significant association of

shoulder adhesive capsulitis with carpal tunnel syndrome, Dupuytren's disease and limited joint mobility syndrome.

Various studies[12,13] showed that adhesive capsulitis of shoulder was seen in patients with poor glycemic control.

Shoulder hand syndrome

The association of adhesive capsulitis with pain, swelling, dystrophic skin and vasomotor instability of the hand constitutes the "shoulder hand syndrome". It is a rare, but potentially disabling manifestation of diabetes.[18]

Steinbrocker and Argyros described three stages of this syndrome. First stage lasts for 3-6 months and is characterised by pain, tenderness, swelling and vasomotor changes. The second stage lasts for 3-6 months and is characterised by trophic skin changes and in the final stage there is atrophy of skin and subcutaneous tissue, tendon contractures and progressive osteopenia. Motor abnormalities such as tremors, involuntary movements and muscle spasms have been reported.[19]

Diabetic cheiroarthropathy

Diabetic cheiroarthropathy is also known as diabetic stiff hand syndrome, diabetic hand syndrome and syndrome of limited joint mobility. It is characterised by thick, tight, waxy skin with limited joint range of motion and sclerosis of tendon sheaths.[20] The possible sites in the tissues leading to impaired mobility include alterations of the structures in the hand such as intrinsic muscle, joint capsule, subcutaneous tissues and alterations of structures extensive to the hand such as long flexor muscles and flexor tendons of forearm.[21]

A study done showed that limited joint mobility was significantly more frequent in the diabetic patients 36 out of 80, than in the controls 7 out of 47. Out of 36 patients, 9 patients had severe joint limitation, 13 moderate limitation & 14 slight limitation. The 7 control patients with joint limitation had only slight impairment of joint mobility. A history of additional rheumatic complaints was seen in 21 diabetic patients.[21]

A study done showed limited mobility of small & large joints in 92 of 309 patients with diabetes. Among patients who had diabetes for >4.5years, 82 of 169 had joint limitation and > 50% of these patients had microvascular complications.[22]

In the study by Sarkar[8], limited joint mobility was seen in 113 diabetic patients (13.1%) out of which 92.1% were of type 1. Of the 113 patients 93 had diabetes for more than 5 years duration.

Limited joint mobility and Dupuytren's disease are commonly found in the same patient. Limited joint mobility is more prevalent in patients with diabetic neuropathy than in those without.[23]

Study by Renard E[24] showed prevalence of various soft tissue hand lesions was higher in both type 1 and type 2 diabetics (33.3 and 26.7%) than in their control population (5.0 and 8.3%).

Dupuytren's disease

Thickening, shortening, fibrosis and nodule formation of the palmar fascia is termed Dupuytren's contracture. The pathological changes result in flexion contracture of the fingers. It is the most common rheumatologic manifestation of diabetes seen in the hand.[3] In patients with diabetes, ring and middle finger are more commonly affected compared to the fifth finger in patients without diabetes.[25]

The pathogenesis of Dupuytren's contracture has been described to the occurrence of modified fibroblasts that resemble smooth muscle cells and are contractile within tendon nodules. Proliferation of these cells with subsequent contraction, might subject neighboring fascial structures to intermittent tension resulting in hypertrophy.

Dupuytren's contracture occurs in more than I/3rd of the patients with diabetes especially those with longstanding poorly controlled diabetes.[26] Prevalence of Dupuytren's contracture in diabetic patients ranges from 20-63% compared to 13% in the general population.[27] A study by Holt[28] has shown that 21-63% of patients with diabetes have Dupuytren's contracture in contrast to 5-22% of the normal population.

Noble[25] reported the development of this complication in more than 50% of patients with diabetes and an increase in incidence with duration of diabetes. As high as 16% of adults with diabetes had Dupuytren's contracture at the time of diagnosis of diabetes mellitus.

Carpal tunnel syndrome

Carpal tunnel syndrome is a disorder characterized by paraesthesia over the median nerve cutaneous distribution. It is caused by compression of median

nerve within carpal tunnel, diabetic neuropathy or combination of both.[27] It's specific relation to diabetes is thought to be due to median nerve entrapment caused by diabetes induced connective tissue changes. Tinel's sign and phalen's test assist in the diagnosis of CTS

CTS is more common in women than men. Phalen reported that diabetes was present in 63 of 379 patients with carpal tunnel syndrome. The prevalence of CTS in diabetic patients increases with the duration of diabetes.[20]

Carpal tunnel syndrome is common in patients with diabetes, the prevalence is 11-16%. In the study done by Renard[24] carpal tunnel syndrome was seen in 26.7 and 15% of type 1 and Type 2 diabetics as compared to 3.3 and 5% of the control population.

Neuroarthropathy

Neuroarthropathy is a severe destructive form of degenerative arthritis resulting from loss of sensation in the involved joints. It is also called Charcot's joints or diabetic osteoarthropathy.[20] Diabetes is one of the major causes of Charcot's joints. It is usually seen in long standing diabetes often complicated by hypertension, proteinuria and retinopathy. The foot is most commonly involved followed by ankle and knee. Unilateral painless foot swelling is the most common finding.

Radiographically there are destructive changes of the tarsometatarsal and metatarsophalyngeal joints, which include circumscribed osteoporosis, subluxation, osteolysis, fractures and periosteal reactions. Radiological features appear usually late in the disease. The incidence is mainly 0.1-0.4% in diabetic patients. The duration disease in diabetics is approximately around 15 years.

Study done by Sarkar[8] showed that the neuroarthropathy of knee and foot was seen in 3.2% of diabetics as compared to 0.6% non diabetics.

Diffuse idiopathic skeletal hyperostosis

Diffuse idiopathic skeletal hyperostosis is also known as ankylosing hyperostosis. It is characterized by flowing calcification of paraspinal ligaments. It commonly affects thoracic spine followed by the lumbar and cervical spine.[3]

A proposed pathogenesis for the occurrence of DISH in patients with diabetes mellitus is the prolonged and high levels of insulin and insulin like growth

factors occurring in diabetic patients, which stimulates new bone formation. Marked hyperinsulinemia has been demonstrated in DISH.[26]

In the study by Holt[28], DISH was seen in 25% of patients among 428 diabetics.

Osteoarthritis

Osteoarthritis or degenerative joint disease is the commonest rheumatic disease in the general population. It most commonly involves the large weight bearing joints. The prevalence of osteoarthritis of large and small joints is higher among patients with diabetes.[7] The incidence is more in type 2 diabetics.[20]

Crispond Heathcoate reported that OA is more common in young and middle aged diabetics. The joint damage starts at a much earlier age and is more severe in diabetics than in control population.

Study done by Sarkar[6] showed osteoarthritis and diabetes have a positive correlation. It was observed in 31.1% of diabetic patients. Out of this 31.1%, 85% were type 2 diabetics and the incidence among women (78%) was higher when compared to men (57%).

Gout is a heterogenous disorder characterized by hyperuricemia and arthritis. It usually affects lower extremities.[8]

In the study conducted by Sarkar,[6] acute gouty arthritis was seen in only 0.8% cases, although symptomatic hyperuricemia was seen in 3% patients with diabetes mellitus. In a study conducted in 6000 patients with diabetes, no case of gouty arthritis was found. Framingham study also showed no association between diabetes mellitus and gouty arthritis.[7]

Flexor tenosynovitis

Flexor tenosynovitis or trigger finger is caused by fibrous tissue proliferation in the tendon sheath leading to limitation of the normal movement of the tendon.[27]

In the study by Renard [24], flexor tenosynovitis was seen in 23.3% and 16.7% of type 1 and type 2 diabetics respectively as compared to 0 and 3.3% in the control population.

From various studies we can conclude that adhesive capsulitis, diabetic hand syndrome, Dupuytren's contracture and DISH are more prevalent in diabetics than non diabetics. Despite the lack of a proven pathophysiological basis,

these interrelationships may be clinically relevant. The prevalence of one of these manifestations may provide a clue to underlying glucose intolerance. The diabetics should be monitored regularly, as they are at an increased risk for the development of rheumatological manifestations than the general population.

6.3 AIMS AND OBJECTIVES OF THE STUDY

To study the clinical profile of Rheumatological manifestations in diabetic patients.

7. MATERIALS AND METHODS

7.1 Source of Data

300 randomly selected patients with diabetes mellitus visiting Endocrinology and Medicine OPD at DAYANAND Medical College and Hospital.

7.2 METHOD OF COLLECTION OF DATA

Sample size: 300 patients with diabetes mellitus.

Duration of study –ONE and A HALF YEAR

Inclusion criteria:

CONSENTING SUBJECTS AGED 18 YEAR AND ABOVE WITH DIABETES MELLITUS.

Exclusion Criteria:

MODY

Latent onset diabetes

History of trauma related musculoskeletal morbidities

Patients with Pre-Existing chronic kidney Disease

Previous cerebrovascular accident

Standardised definitions used in diagnosis

1. Adhesive capsulitis (frozen shoulder): Patients having shoulder pain on motion, with a minimum VAS score of 30 mm, and limitation of active and passive range of movement greater than 25% in both abduction and external rotation compared to the other shoulder.

2. Carpal tunnel syndrome: Diagnosis of Carpal tunnel syndrome will be based on Tinel's test and Phalen's test.

3. Dupuytren's contracture: Patients having pitting and thickening of the palmar skin with a firm, painless nodule, fixed to the skin and deep fascia with contracture of the ring and little finger.

4. Diabetic cheiroarthropathy (limited joint mobility): 'Prayer sign' and 'Table test'.

5. Flexor tenosynovitis: Patients having a palpable nodule, usually in the area overlying the meta-carpophalangeal joint (MCP), and thickening along the affected flexor tendon sheath on the palmar aspect of the finger and hand. The locking phenomenon may be reproduced with either active or passive finger flexion.

6. DISH: The presence of more than two bridge between contiguous vertebrae is taken for the diagnosis of DISH.

7. Rheumatoid arthritis: American Rheumatism Association revised criteria 2010.

8. Osteoarthritis: Diagnosed using Altman's clinical criteria of pain, crepitus, morning stiffness, age and bony enlargement.

OUTCOME

Statistical Analysis

Data will be described in terms of range; mean ±standard deviation (± SD), frequencies (number of cases) and relative frequencies (percentages) as appropriate. All statistical calculations will be done using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

- Fasting blood glucose
- Postprandial blood glucose
- HBA1C
- X-ray of Joint(wherever required)

7.4 HAS ETHICAL CLEARANCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Attached herewith

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PROFORMA

Serial No:

Name: MRD No.

Age :

Sex :

Qualification:

Family Income:

Address:

Occupation:

Presenting complaints:

Joint pain

Joint swelling

Restriction of movements at the joints

Past history:

Duration of diabetes:

Age at onset of diabetes:

Treatment taken: OHA / Insulin Hypertension / Stroke / Bronchial Asthma

History of cardiac illness / renal disease / liver disease *

Signature of Supervisor

Signature of Candidate

Family history of diabetes:

Personal history:

History of smoking / alcohol consumption:

General Physical Examination:

Pulse: BP: Temp:

Ht: Wt: BMI:

Waist circumference:

W/H Ratio :

Pallor / Icterus / Cyanosis / Clubbing / Lymphadenopathy / Edema

Other positive findings :

Joint examination:

Joint involved:

Other joints:

Systemic examination:

CVS :

RS :

P/A:

CNS:

Signature of Supervisor Signature of Candidate

Investigations:

FBS:

PPBS:

HBA1C:

X-ray Hand Shoulder Knee(wherever required)

Spine (AP view) Other involved joint

Adhesive capsulitis	Y/N
Carpal tunnel syndrome	Y/N
Dupuytren's contracture	Y/N
Diabetic cheiroarthopathy/limited joint mobility	Y/N
Flexor tenosynovitis/trigger finger	Y/N
Diffuse Idiopathic Skeletal Hyperostosis(DISH)	Y/N
Rheumatoid Arthritis	Y/N
Osteoarthritis	Y/N

Signature of Supervisor

Signature of Candidate

INFORMED PATIENT CONSENT

Date: _____

I.....D/o, W/o, S/o.....
.....am willing to participate in the study **"STUDY OF RHEUMATOLOGICAL MANIFESTATIONS AMONG PATIENTS WITH DIABETES MELLITUS"** The procedure with its complications has been explained to me in local vernacular language. I have fully understood that no special tests and extra expenditure in any form, merely for the purpose of thesis is being carried out. I am free to opt out the study any time without assigning any reason.

.....
Signature of the Witness

Name:

.....
Signature of the patient

Signature of Candidate

Signature of Supervisor

मरीज अनुमति फार्म

तिथि _____

मैं _____ पत्नी/पुत्र/पुत्री _____

निवासी _____

इस शोधकार्य **"STUDY OF RHEUMATOLOGICAL MANIFESTATIONS AMONG PATIENTS WITH DIABETES MELLITUS"** में भाग लेने के लिए सहमत हूँ। मैं इस शोधकार्य में भाग लेने के लिए अपनी स्वेच्छा से तैयार हूँ। मैं पुष्टि करता/करती हूँ की यह स्वीकृति देने के लिए मुझे कोई आर्थिक प्रलोभन नहीं दिया गया और न ही दबाव डाला गया है। मुझे इस शोधकार्य का उद्देश्य स्पष्ट कर दिया गया है और मुझे यह विश्वास है की यह विज्ञान और मानवता के लाभ के लिए है। मुझे इस शोधकार्य में होने वाले जोखिम के बारे में समझा दिया गया है और मेरी समझ में यह जोखिम बहुत मामुली है।

मैं इस शोधकार्य में भाग लेने के सम्बन्ध में किसी भी समय अपनी अस्वीकृति व्यक्त कर सकता/सकती हूँ और मेरे अस्वीकृति व्यक्त करने का मेरे इलाज पर कोई प्रभाव नहीं पड़ेगा।

_____ _____

गवाह के हस्ताक्षर रोगी के हस्ताक्षर/अंगूठे का निशान

नाम: नाम:

_____

अन्वेषक के हस्ताक्षर

_____

विद्यार्थी के हस्ताक्षर

ਮਰੀਜ਼ ਰਜ਼ਾਮੰਦੀ ਫਾਰਮ

ਮਿਤੀ_____

ਮੈ_____ਪਤਨੀ/ਪੁੱਤਰ/ਪੁੱਤਰੀ_____

ਵਾਸੀ _____

"STUDY OF RHEUMATOLOGICAL MANIFESTATIONS AMONG PATIENTS WITH DIABETES MELLITUS" ਤੇ ਚਲ ਰਹੀ ਖੋਜ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਰਜ਼ਾਮੰਦ ਹਾਂ। ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਮੈ ਆਪਣੀ ਮਰਜ਼ੀ ਨਾਲ ਤਿਆਰ ਹਾਂ। ਮੈ ਇਹ ਦਸਣਾ ਚਾਹੁੰਦਾ ਹਾਂ/ ਚਾਹੁੰਦੀ ਹਾਂ ਕੇ ਇਹ ਰਜ਼ਾਮੰਦੀ ਦੇਣ ਵਾਸਤੇ ਮੈਨੂ ਕਿਸੇ ਵੀ ਤਰਾਂ ਦਾ ਲੋਭ-ਲਾਲਚ ਨਹੀ ਦਿੱਤਾ ਗਿਆ ਅਤੇ ਨਾ ਹੀ ਕੋਈ ਦਬਾ ਪਾਇਆ ਗਿਆ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਦਾ ਮਨੋਰਥ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਭਰੋਸਾ ਦਵਾਇਆ ਗਿਆ ਹੈ ਕੇ ਇਹ ਖੋਜ ਵਿਗਿਆਨ ਅਤੇ ਮਾਨਵਤਾ ਦੀ ਭਲਾਈ ਲਈ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਵਿਚ ਹੋਣ ਵਾਲੇ ਖਤਰੇ ਬਾਰੇ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਯਕੀਨ ਹੈ ਕੇ ਇਹ ਖਤਰਾ ਬਹੁਤ ਮਾਮੂਲੀ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਦਾ ਢੰਗ – ਤਰੀਕਾ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ। ਮੈ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਬਾਰੇ ਆਪਣੀ ਰਜ਼ਾਮੰਦੀ ਕਿਸੇ ਵੀ ਸਮੇ ਵਾਪਸ ਲੈ ਸਕਦਾ ਹਾਂ/ ਸਕਦੀ ਹਾਂ ਅਤੇ ਮੇਰੀ ਰਜ਼ਾਮੰਦੀ ਵਾਪਸ ਲੈਣ ਦਾ ਮੇਰੇ ਇਲਾਜ ਤੇ ਕੋਈ ਅਸਰ ਨਹੀ ਹੋਵੇਗਾ।

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ਗਵਾਹ ਦੇ ਹਸਤਾਖਰ

ਮਿਤੀ_____

ਪਤਾ _____

_____
ਮਰੀਜ਼ ਦੇ ਹਸਤਾਖਰ

ਮਿਤੀ_____

ਪਤਾ _____

_____
ਨਿਰੀਖਕ ਦੇ ਹਸਤਾਖਰ

_____
ਸਿਖਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ